HIGHLIGHTS

Characteristics of New Doctorate Recipients in 1988

- In 1988, 33,456 Ph.D.s were graduated from U.S. universities, an increase of 1,089 since last year. This number approached the 1973 peak of 33,755 degrees. The doctorates were distributed among the seven broad fields as follows: education (6,349), life sciences (6,143), social sciences (5,769), physical sciences (5,309), engineering (4,190), humanities (3,553), and professional/other (2,143).

- Women earned 11,790 doctoral degrees in 1988, the largest number of any year. Their proportionate share of the cohort, however, has remained at about 35 percent for the past three years. Despite gains in many fields, women continued to be underrepresented in physical sciences and engineering, accounting for 17 percent and 7 percent of 1988 Ph.D.s, respectively.

- In 1988, 7,787 Ph.D.s were awarded to non-U.S. citizens (1,611 to permanent residents and 6,176 to temporary residents). Foreign nationals received 25 percent of all doctoral degrees, the highest proportion ever. Moreover, they earned 54 percent of the degrees in engineering and 35 percent of the degrees in physical sciences. Asian countries supplied the greatest number of foreign national Ph.D.s.

- Among U.S. citizens, whites accounted for 90.8 percent of all doctorates in 1988, followed by blacks (3.5 percent), Asians (2.7 percent), Hispanics (2.6 percent), and American Indians (0.4 percent). The number of Ph.D.s earned by black men continued to decline, falling to 311 degrees in 1988; this represents a 47 percent decrease over the last 10 years.

- About 50 percent of new Ph.D.s in 1988 reported having at least one parent with a college degree. While 61 percent of U.S. Asians and 53 percent of U.S. whites reported having parents with college degrees, percentages were much lower for Hispanics (41 percent), blacks (30 percent), and American Indians (30 percent).

Graduate Education

- In 1988, total elapsed time-to-degree (TTD) from year of baccalaureate to year of doctorate was a median 10.5 years, the longest ever. Median registered or enrolled time (RTD) was 6.9 years, the same as last year. Time-to-degree was longer for Ph.D.s in the social sciences and the nonsciences than in the natural sciences.

- Doctorate recipients in 1988 received 43 percent of their support in graduate school from personal sources, 39 percent from universities, and 10 percent from the federal government. Ph.D.s in engineering and physical and life sciences received most support from universities, while Ph.D.s in social sciences and the nonsciences were largely self-supporting.

- More than half of doctorate recipients in 1988 reported no educational debt upon graduation. Among Ph.D.s reporting debt, the median level owed was about $7,500. Engineers showed the lowest percentage with debt (34 percent); physical science Ph.D.s had the lowest median level of debt ($6,200). Social science doctorates, on the other hand, reported both the highest percentage with debt (61 percent) and the largest median amount owed ($9,900).

Postgraduation Plans (Special Section)

- Among new doctorate recipients in 1988 with definite postgraduation commitments, 74 percent planned to be employed while 26 percent planned to continue their education. This represents a proportionate shift from employment to study of more than 13 percentage points since 1968. This shift was most pronounced among temporary residents and in the physical and life sciences.

- The proportion of non-U.S. citizen doctorates electing to remain in the United States after graduation increased over the last 20 years to 85 percent of permanent residents and 56 percent of temporary residents in 1988, with temporary residents showing dramatic growth during the last decade. Permanent residents staying in the United States favored employment over study by a ratio of 3:1, while the majority of temporary residents staying planned to continue their education.

- Although postdoctoral fellowships were held by half of new Ph.D.s with study commitments in 1988, the proportion of Ph.D.s supported by this mechanism declined over the past two decades. Research associateships, on the other hand, increased to 40 percent of commitments in 1988. The U.S. government was the largest provider of postdoctoral study support in 1988 (47 percent), followed by colleges and universities (29 percent).

- Employment in the academic sector of the U.S. labor force declined over the past 20 years (from 67 to 50 percent of U.S. citizens and permanent residents), while employment in other sectors (especially industry) grew. The decline in academe was especially severe in social sciences and education.

- Teaching remained the most frequently reported primary work activity of Ph.D.s despite its decline from 55 percent in 1968 to 37 percent in 1988. Research and development suffered a slight decline too, showing proportionate growth only in academe. Administration and professional services increased in both proportion and number of new Ph.D.s.

- In 1988, 68 percent of U.S. citizens and permanent residents planned to work in the same fine field as their doctorate, and 85 percent planned to work in the same major field (compared to 78 percent and 90 percent, respectively, in 1970). In general, the academic sector experienced slightly less field-switching than did other sectors.

Summary Report 1988

Doctorate Recipients from United States Universities

The Survey of Earned Doctorates is conducted
for the National Science Foundation
U.S. Department of Education
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NOTICE: The project that is the subject of this report was approved by the Governing Board of the National Research Council, whose members are drawn from the councils of the National Academy of Sciences, the National Academy of Engineering, and the Institute of Medicine. The survey project is part of the program of the Office of Scientific and Engineering Personnel (OSEP).

This report has been reviewed by a group of persons other than the author according to procedures approved by a Report Review Committee consisting of members of the National Academy of Sciences, the National Academy of Engineering, and the Institute of Medicine.

The National Academy of Sciences is a private, nonprofit, self-perpetuating society of distinguished scholars engaged in scientific and engineering research, dedicated to the furtherance of science and technology and to their use for the general welfare. Upon the authority of the charter granted to it by the Congress in 1863, the Academy has a mandate that requires it to advise the federal government on scientific and technical matters. Dr. Frank Press is president of the National Academy of Sciences.

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This report is based on research conducted by OSEP, with the support of the National Science Foundation, the U.S. Department of Education, the National Institutes of Health, the National Endowment for the Humanities, and the U.S. Department of Agriculture under NSF Contract No. SRS-8517008. Opinions, findings, conclusions, or recommendations expressed in this publication are those of OSEP and do not necessarily reflect the view of the sponsoring agencies.

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PREFACE AND ACKNOWLEDGMENTS

This report presents a summary of the results of the 1987-88 Survey of Earned Doctorates (SED), which has been conducted each year since 1958 by the National Research Council's Office of Scientific and Engineering Personnel (OSEP) and its predecessor organization, the Commission on Human Resources. Questionnaire forms, distributed with the cooperation of the graduate deans of U.S. universities, are filled in by graduates as they complete requirements for their doctoral degrees. The doctorates are reported by academic year (from July 1 of one year through June 30 of the following year) and include research and applied-research doctorates in all fields. Professional degrees such as the M.D., D.D.S., O.D., D.V.M., and J.D. are not covered by this survey. A full list of included degrees can be found inside the back cover. For convenience throughout this report, "Ph.D." is used to represent any of the doctoral degrees covered by the survey.

Responses were received from 31,014, or 93 percent, of the 33,456 persons who earned doctorates in academic year 1988. When individuals did not complete the questionnaire, abbreviated records were compiled using information from the universities' commencement bulletins. As a result, basic information--such as gender, field, institution, and year of Ph.D.--is available for all of the 33,456 doctorate recipients.

This *Summary Report* is the twenty-second in an annual series of reports that began in 1967. Trend data from earlier periods can be found in the book *A Century of Doctorates: Data Analyses of Growth and Change* (National Academy of Sciences, 1978). All survey responses become part of the Doctorate Records File (DRF), a virtually complete data bank on doctorate recipients from 1920 to 1988. More than 85 percent of the 916,615 records now in the DRF have come from results of the 1958-1988 surveys. For doctorates granted during the 1920-1957 period, information was compiled from commencement bulletins, registrars' records, and other published material.

The conduct of the SED, the maintenance of the resulting data file, and the publication of this report are funded jointly by the National Science Foundation, the National Institutes of Health, the U.S. Department of Education, the National Endowment for the Humanities, and the U.S. Department of Agriculture. The interest, aid, and counsel of Susan Hill (NSF), the project officer for the agencies, are appreciated. In addition, Mary Golladay of the National Science Foundation, Charles Sherman of the National Institutes of Health, Jeffrey Thomas of the National Endowment for the Humanities, Leo Eiden and Linda Zimbler of the U.S. Department of Education, and K. Jane Coulter and Marge Stanton of the U.S. Department of Agriculture have provided constructive reviews of the design and analysis of the survey. Their contributions increase the survey's relevance to national policy issues. We also express deep appreciation to the graduate deans in the doctorate-granting institutions for their continuing interest in and assistance to this project.

The 1987-88 SED was conducted under the administrative supervision of Susan L. Coyle. Joanne M. Weinman, Ms. Coyle's successor as project manager, and Delores Thurgood were jointly responsible for the development of the report and analysis of survey results. Yupin Bae produced the graphics and contributed to the data analysis and review of the report. Daniel Pasquini generated data for the report and was responsible for reviewing drafts and desk-top publishing the final manuscript. Martha Bohman produced

all drafts of the reports. Inasmuch as Ms. Weinman is new to the survey staff, she would like to make a special acknowledgment of the work and support of Delores Thurgood, Yupin Bae, Daniel Pasquini and Martha Bohman. Their extensive knowledge of and experience with the SED data as well as with project procedures allowed this report to be produced with the same thoroughness as in previous years and in a timely manner. Special appreciation is also expressed to the following people: Eileen Milner, who supervised the coding and editing of the data; George Boyce, manager of OSEP's Data Processing Section; Joseph Finan and Maren Herman, who were responsible for the computer programming and processing; and Linda S. Dix, OSEP's reports officer, who edited the report.

OSEP is concerned with those activities of the National Research Council that contribute to the more effective development and utilization of the nation's scholars and research personnel. Its programs seek to strengthen higher education and to develop better understanding of the education process. It is hoped that reporting of the present data to education institutions, government agencies, and professional societies will facilitate planning in higher education. Suggestions for improvement of the content or format of the report, other comments, and questions are welcome.

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INTRODUCTION

In academic year 1988 (July 1, 1987, through June 30, 1988), 33,456 Ph.D.s were graduated from U.S. universities, an increase of 2,581 degrees since 1978 and 1,089 since last year. The number in 1988 approached the peak of 33,755 recipients in 1973. However, while the sizes of the classes were comparable, the characteristics of the doctorates were quite different. In 1988, there were 5,705 more women and 2,615 more foreign citizens (mostly temporary residents) than 15 years ago. Ph.D.s took longer to earn their degrees: total elapsed time from baccalaureate to doctorate increased from a median 8.4 years in 1973 to 10.5 years in 1988; and registered or enrolled time grew from 5.8 years to 6.9 years. The median age of recipients was 2.5 years older in 1988.

Selected statistics from the 1987-88 Survey of Earned Doctorates (SED) are presented in this report, along with trend data from the comprehensive Doctorate Records File. The body of the report discusses highlights of these data. Supplementary tables on 1988 doctorates are displayed in Appendix A, and 1978-1988 fine-field data are displayed in Appendix B.

In recent years, summary reports have included special sections that emphasize portions of the data collected. This year's special section focuses on the immediate postgraduation plans of doctorate recipients and changes that have taken place over the last 20 years. It discusses the growing trend towards postdoctoral study; the increase in foreign-born Ph.D.s who elect to remain in the United States after graduation; the shift from academe into other sectors of the U.S. labor force; the ensuing changes in primary work activities; and the prevalence of field-switching among those Ph.D.s who obtained employment. These changes are examined by field of doctorate and demographic characteristics of recipients, such as gender, race/ethnicity, citizenship, and country of origin for foreign-born doctorates. Study mechanisms and sources of postdoctoral research support are investigated for Ph.D.s who planned to continue their education. Sources of graduate school support are examined for Ph.D.s who planned to work primarily in research.

Seven broad fields are profiled in the summary reports. Readers should note that these fields may differ from those reported by federal sponsors of the survey. The broad fields discussed in this report are:

- Physical Sciences (including mathematics and computer sciences)
- Engineering
- Life Sciences (biological, health, and agricultural sciences)
- Social Sciences (including psychology)
- Humanities
- Education
- Professional and Other Fields

TRENDS IN THE NUMBER OF DOCTORATES

In academic year 1988, 33,456 doctorates were awarded by U.S. colleges and universities. About 87 percent of these degrees were Ph.D.s or D.Sc.s; 10 percent were Ed.D.s; and the remainder were other specialized doctorates.

For the third consecutive year, the number of students earning doctoral degrees increased. This rise occurred after a plateau that characterized the first half of the 1980s. As seen in Figure 1 and Table A, the number of Ph.D.s had its initial and rapid rise in the 1960s and peaked at 33,755 in 1973. A decline then occurred through 1978, after which the number of Ph.D.s stabilized at a figure of about 31,200 annually. The last three years of data show a return to growth in doctorate production, and the current year approaches the 1973 peak.

Although the number of doctorates more than tripled between 1960 and 1988, not all groups of recipients increased proportionately. For example, non-U.S. citizens increased nearly sevenfold, from 1,176 in 1960 to 7,787 in 1988. Women increased more than elevenfold, from 1,042 recipients in 1960 to 11,790 in 1988.

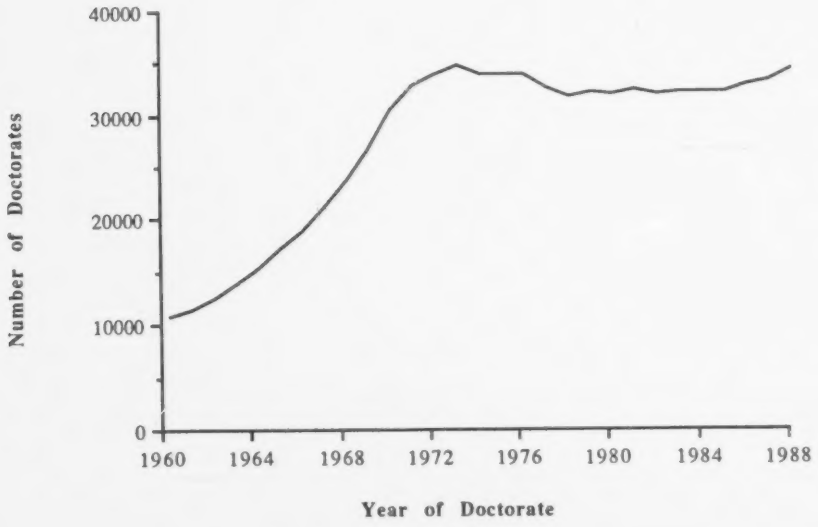

Figure 1. Doctorates awarded by U.S. colleges and universities, 1960-1988.

TABLE A: Doctorates Awarded by U.S. Colleges and Universities, 1960-1988

Year	Number	Year	Number	Year	Number	Year	Number
1960	9,733	1967	20,403	1974	33,047	1981	31,357
1961	10,413	1968	22,936	1975	32,951	1982	31,106
1962	11,500	1969	25,743	1976	32,946	1983	31,280
1963	12,728	1970	29,498	1977	31,716	1984	31,332
1964	14,325	1971	31,867	1978	30,875	1985	31,291
1965	16,340	1972	33,041	1979	31,239	1986	31,896
1966	17,949	1973	33,755	1980	31,020	1987	32,367
						1988	33,456

Field Trends

Figure 2 shows the trend in doctorate production from 1960 to 1988 for each of the seven broad fields (the figure is displayed in two parts in order to more clearly illustrate trend lines). While the total number of degrees awarded in 1988 approached the 1973 number, the pattern that emerged from disaggregation of fields was different for the two years. Doctorates in each field, as a proportion of the total number of doctorates awarded, are shown below to point out these differences (see Table C on page 8 for numbers on which percentages are based):

	1973	1988
Total doctorates	33,755	33,456
Physical Sciences	15.7%	15.9%
Engineering	10.0	12.5
Life Sciences	15.3	18.4
Social Sciences	17.1	17.2
Humanities	16.0	10.6
Education	21.4	19.0
Professional/Other	4.5	6.4

Engineering and life sciences (an umbrella term covering the biological, agricultural, and health sciences) showed proportionate increases of 2.5 and 3.1 percentage points, respectively, since 1973. Between 1973 and 1988, the number of Ph.D.s awarded in life sciences as a whole increased by 19 percent (from 5,167 to 6,143 Ph.D.s). However, while biological and agricultural sciences both grew by 13 percent over the period, health sciences increased by 78 percent (from 486 to 867 Ph.D.s). Moreover, health science degrees constituted 14 percent of all life sciences doctorates in 1988, compared to 9 percent in 1973. The field of nursing fueled this increase, accounting for 60 percent of the growth in health sciences over the last decade (data on nursing are not available for earlier years). Between 1978 and 1988, the number of doctorates in nursing rose from 32 to 246, nearly doubling in the last five years alone.

Professional/other fields also showed a small proportionate increase from 1973 to 1988. This was the one broad area which grew in most years since 1960, steadily climbing upward from 241 recipients to 2,143 in 1988, almost a ninefold increase. The fields of

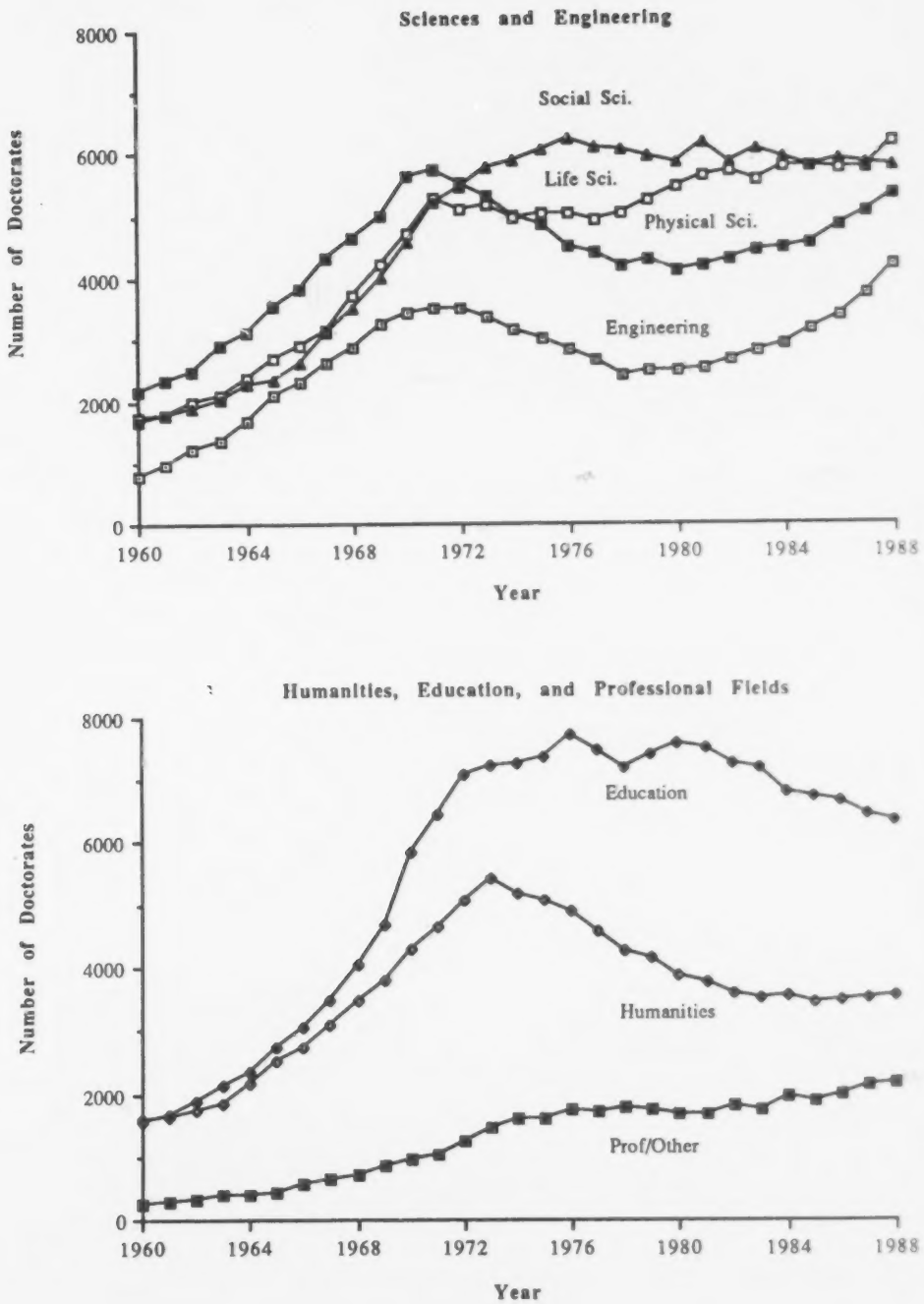

Figure 2. Number of doctorate recipients, by broad field, 1960-1988.

physical sciences and social sciences accounted for about the same proportions of doctorates in both 1973 and 1988 (16 percent and 17 percent, respectively). However, physical sciences declined in the interim years but has since recovered, while social sciences rose in the interim but has now fallen off to its 1973 level. The fields of education and humanities have decreased since 1973. After growing somewhat during intervening years to its peak number of 7,725 doctorate recipients in 1976, education has now fallen 18 percent below its 1973 level, to 6,349 in 1988. Humanities continued its downward trend in proportionate shares, decreasing from 16 percent of all doctorates in 1973 to 11 percent in 1988. Humanities has not shown the recovery that physical sciences and engineering have, but unlike social sciences and education, its decline does seem to have been stemmed. The number of humanities doctorates peaked at 5,414 in 1973; in 1988, there were 3,553, a number that has been relatively stable for the last 7 years.

The characteristics of recipients in the various fields have also been changing. In 1973, about 79 percent of new physical science doctorates and 65 percent of new engineering doctorates were U.S. citizens (based on responses to citizenship status). In 1988, the U.S. percentages were about 65 and 46, respectively. Other types of changes were in the number of specialists within these fields. For example, within physical sciences, the number of mathematics Ph.D.s peaked in 1972 at 1,281; by 1988 only 749 Ph.D.s in mathematics were awarded, a decrease of 42 percent. Moreover, nearly half of the mathematics doctorates in 1988 were awarded to non-U.S. citizens.

Women have significantly increased their proportion among life sciences doctorates, from 18 percent in 1973 to 37 percent in 1988. Women have also increased their presence in professional/other fields: in 1973 women represented 13 percent of the recipients; this year they received 32 percent of the doctorates. Most of the growth in the last decade was in business administration, although women in social work, communications, and theology experienced large increases as well.

Table B presents, by field, the major baccalaureate sources of doctorates who graduated in the 1986-1988 period (no measure of quality is inferred: many of the institutions on this list have large student enrollments and are therefore likely to be sources of large numbers of future doctorates). Among all doctorates, the top five baccalaureate institutions were the University of California-Berkeley (1,000); the University of Michigan (837); the University of Illinois-Urbana (734); Cornell University (733); and Pennsylvania State University (694). Ten of the institutions in Table B are publicly controlled, and seven are privately controlled. Of the public institutions, five are in the Midwest, and three are University of California campuses. Eleven of the schools also appeared on the list of leading doctorate institutions for 1983-1987 in last year's report and are in the top 40 for 1988 in this report (See Appendix A, Table 6). Oberlin is the only nondoctorate-granting institution listed in Table B.

TABLE B: Baccalaureate Institutions of 1986-1988 Ph.D.s, by Field of Doctorate (ranked on number of Ph.D.s)

Institution	Number	Institution	Number
Total All Fields		Social Sciences	
Univ of California-Berkeley	1,000	Univ of California-Berkeley	223
University of Michigan	837	Univ of California-Los Angeles	183
University of Illinois-Urbana	734	University of Michigan	160
Cornell University	733	University of Wisconsin-Madison	132
Pennsylvania State University	694	Harvard University	129
Physical Sciences*		Humanities	
Massachusetts Inst Technology	231	Univ of California-Berkeley	136
Univ of California-Berkeley	190	Yale University	112
Cornell University	133	Harvard University	97
Harvard University	119	University of Michigan	97
University of Michigan	112	Oberlin College	93
Engineering		Education	
Massachusetts Inst Technology	204	Ohio State University	155
University of Illinois-Urbana	150	Pennsylvania State University	133
University of Michigan	115	Brigham Young University	127
Purdue University	111	University of Texas-Austin	125
Univ of California-Berkeley	99	Michigan State University	121
Life Sciences		Professional Fields	
Cornell University	231	University of Michigan	54
Univ of California-Berkeley	229	University of Texas-Austin	48
Univ of California-Davis	209	Ohio State University	44
Pennsylvania State University	196	Michigan State University	44
Michigan State University	185	University of Illinois-Urbana	43
		Univ of California-Berkeley	43

*Includes mathematics and computer sciences.

Citizenship Status

Overall, the percentage of foreign doctorate recipients increased between 1960 and 1988 (see Figure 3 and Table C). In 1960, 88 percent (8,469) of doctorates with known citizenship status were U.S. citizens, and 12 percent (1,176) were non-U.S. citizens. By 1988, the percentage for U.S. citizens had dropped 13 points to 75 percent, or 23,172 versus 7,787 Ph.D.s of foreign nationality. The percentage of non-U.S. Ph.D.s increased slowly over the 1960-1978 period and then began to rise at a greater rate when the number of U.S. Ph.D.s started to decline. The sharpest increase in foreign Ph.D.s occurred during the most recent 5-year interval, 1983-1988.

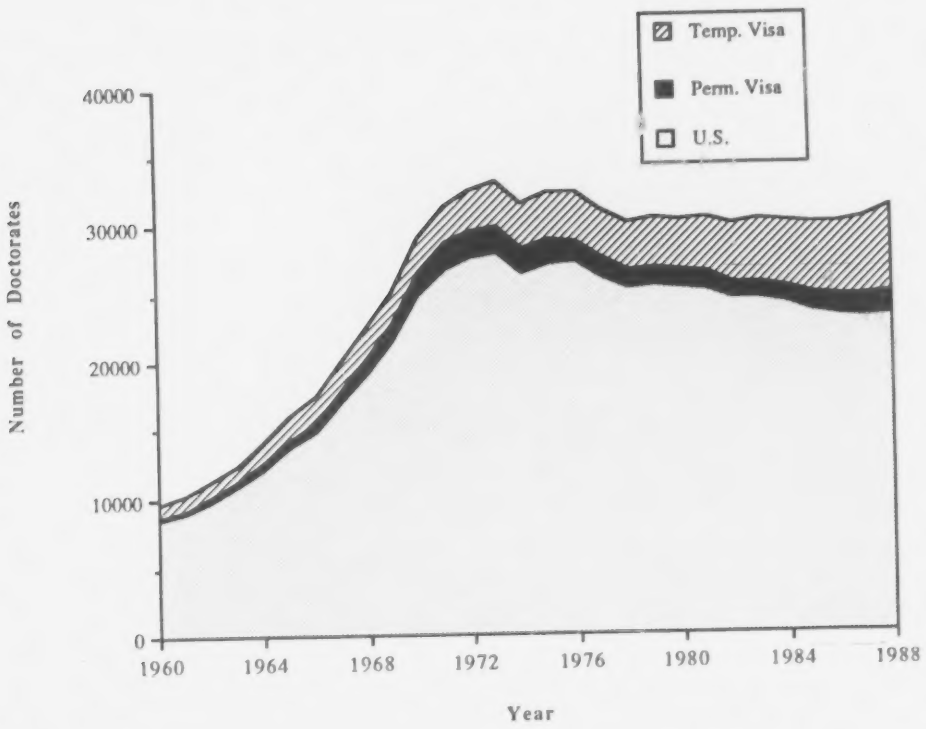

Figure 3. Citizenship composition of doctoral cohorts, 1960-1988.

When the status of non-U.S. citizens is broken down into categories indicating permanent or temporary visas, it can be seen that most of the recent increase occurred among those with temporary visas. The proportion of permanent-resident Ph.D.s rose from 3 percent to 5 percent of the total between 1960 and 1988, but during that period the proportion fluctuated and actually dropped from its high of the early 1970s. The proportion of temporary-resident Ph.D.s, on the other hand, rose steadily from 9 percent to 20 percent between 1960 and 1988, except for a small drop in the early 1970s.

While both the number and proportion of foreign students have increased in all fields since 1960, the trend has been more marked in some fields than in others (see Figure 4). By far, the largest increases occurred in physical sciences and engineering. While the proportion of non-U.S. citizens in these fields multiplied 2-3 times over the period, the annual number of foreign Ph.D.s rose from 183 to 2,089 in engineering and from 284 to 1,729 in physical sciences. Growth was more moderate in the life and social sciences, but by 1988 the annual number of foreign Ph.D.s reached 1,366 in life sciences and 928 in social sciences. Numbers and proportions were much smaller in humanities, education, and professional/other fields.

TABLE C: Percentage Distribution of Doctorate Recipients, by Citizenship and Broad Field, 1960-1988*

Field		Year of Doctorate								
		1960	1964	1968	1972	1973**	1976	1980	1984	1988
Total All Fields		9,733	14,325	22,936	33,041	33,755	32,946	31,020	31,332	33,456
U.S. Citizens	%	87.8	6.3	85.3	84.8	84.4	84.4	83.6	79.9	74.8
Permanent Residents		2.9	3.3	4.6	6.5	6.0	4.6	4.3	4.1	5.2
Temporary Residents		9.3	10.4	10.1	8.7	9.6	10.9	12.1	16.1	19.9
Physical Sciences***		2,152	3,115	4,652	5,538	5,311	4,509	4,111	4,452	5,309
U.S. Citizens	%	86.7	85.2	84.7	80.5	78.6	77.2	76.6	72.5	65.1
Permanent Residents		2.9	3.4	4.1	8.2	8.3	6.8	6.3	4.6	5.1
Temporary Residents		10.4	11.4	11.2	11.4	13.1	16.0	17.1	23.0	29.8
Engineering		794	1,664	2,855	3,503	3,364	2,834	2,479	2,913	4,190
U.S. Citizens	%	76.8	78.3	74.8	67.1	64.5	56.4	52.2	44.5	46.0
Permanent Residents		6.8	6.6	9.7	17.9	16.8	14.1	12.4	9.8	9.5
Temporary Residents		16.3	15.0	15.5	15.0	18.7	29.5	35.4	45.6	44.6
Life Sciences		1,729	2,361	3,707	5,083	5,167	5,026	5,461	5,757	6,143
U.S. Citizens	%	81.9	78.7	79.0	80.1	80.0	81.4	82.4	81.8	76.2
Permanent Residents		3.3	3.5	5.1	7.3	7.2	4.9	4.3	3.5	5.3
Temporary Residents		14.8	17.8	16.0	12.6	12.8	13.7	13.3	14.7	18.5
Social Sciences		1,668	2,258	3,495	5,468	5,758	6,214	5,856	5,930	5,769
U.S. Citizens	%	88.0	87.3	86.6	86.7	86.6	87.7	88.0	85.2	82.3
Permanent Residents		3.0	3.5	4.4	4.7	4.2	3.2	3.5	3.5	4.2
Temporary Residents		9.0	9.3	9.1	8.6	9.2	9.1	8.6	11.3	13.5
Humanities		1,600	2,169	3,467	5,055	5,414	4,881	3,871	3,535	3,553
U.S. Citizens	%	94.0	92.9	91.2	91.5	90.9	91.3	90.8	88.2	84.4
Permanent Residents		3.0	3.3	4.3	4.3	4.4	3.8	3.6	4.3	5.1
Temporary Residents		3.0	3.8	4.5	4.1	4.7	4.9	5.5	7.5	10.5
Education		1,549	2,351	4,029	7,085	7,238	7,725	7,586	6,808	6,349
U.S. Citizens	%	94.8	94.2	94.0	94.1	94.4	93.9	91.6	89.8	89.0
Permanent Residents		0.5	0.7	1.4	1.9	1.5	1.5	1.5	2.0	2.9
Temporary Residents		4.7	5.1	4.6	4.0	4.1	4.6	6.9	8.2	8.1
Professional/Other		241	407	731	1,309	1,503	1,757	1,656	1,937	2,143
U.S. Citizens	%	89.0	83.8	80.0	84.8	83.8	84.4	83.8	77.7	73.3
Permanent Residents		0.8	3.3	7.1	5.4	4.8	4.0	4.2	4.9	6.8
Temporary Residents		10.1	12.9	12.9	9.7	11.3	11.5	12.0	17.4	19.9

*Totals in each field include doctorates with unknown citizenship status. Percents are based on responses to citizenship status. Note: In 1988, citizenship status was not reported by 7.5 percent of Ph.D.s; in 1960, this percentage was 0.9 percent.

**1973 was the peak year for doctorates earned in the United States.

***Includes mathematics and computer sciences.

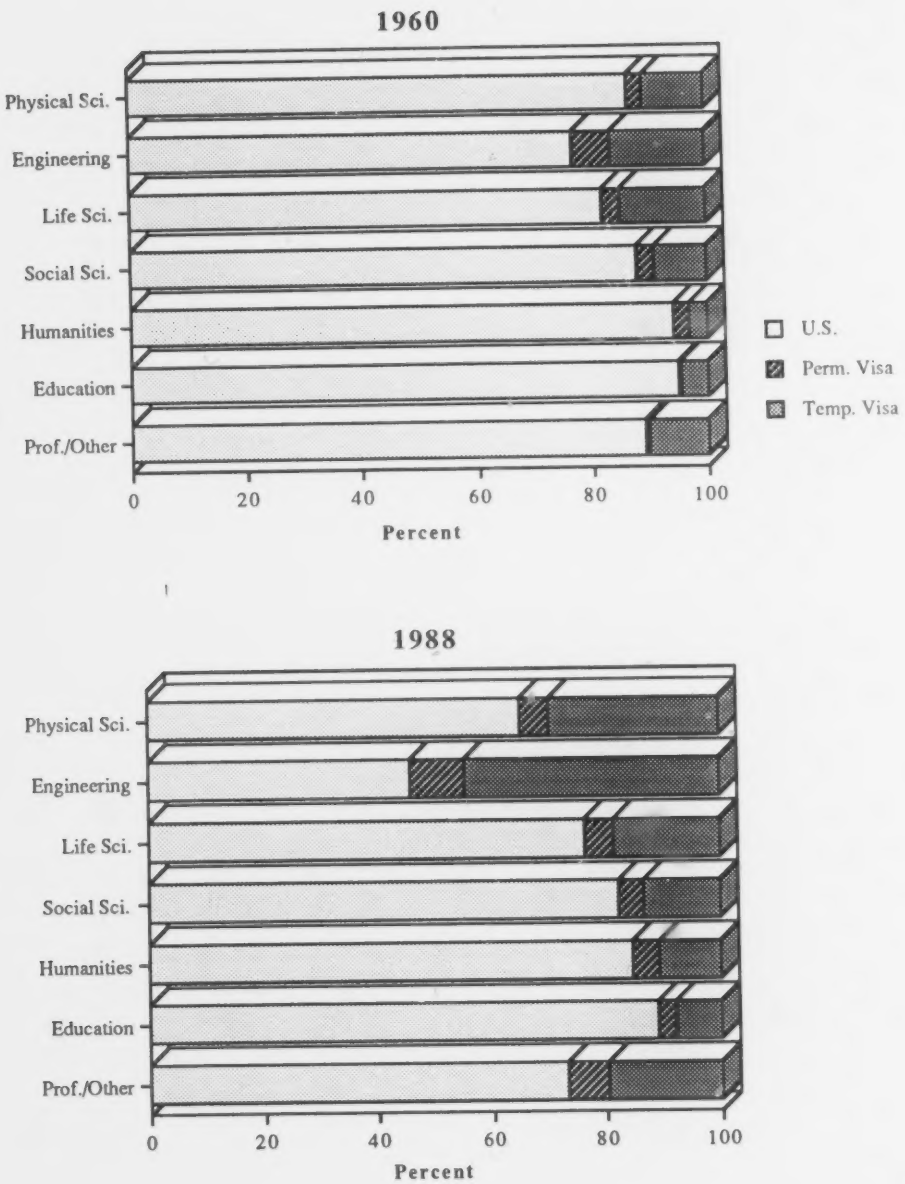

Figure 4. Citizenship status of doctorate recipients, by broad field, 1960 and 1988.
(Note: Percents are based on responses to citizenship status.)

In terms of nationality and geographic region of origin, the composition of the foreign-citizen Ph.D. pool has also been changing. Table D displays the 30 countries supplying the largest number of non-U.S. citizen Ph.D.s from 1986 to 1988. While traditional exchange points in western and northern Europe (England, France, Germany) remain on the list, developing countries in the Americas, the Middle East, and the Far East have increased their shares of Ph.D.s. In fact, the list is dominated by Asian countries: among the top 30 countries, 7 are located in Eastern Asia and 8 more in Western Asia or the Middle East. Five are from the Americas; five are from Europe; three are from Australasia; and two are from Africa.

Citizens of Taiwan held the greatest number of doctoral degrees earned by non-U.S. citizens in the United States. They have steadily increased from 794 doctorates in 1986 to 870 in 1987 and 912 in 1988, for a cumulative total of 2,576 over the period. Yet, although Taiwan was the top supplier of foreign Ph.D.s in each of these years, it showed a much smaller rate of growth (15 percent) than did Korea, the second largest supplier: the number of Korean Ph.D.s increased 59 percent during the same period, from 493 doctorates in 1986 to 786 in 1988. The People's Republic of China (PRC), the fourth country on the list, showed the most dramatic growth, multiplying its numbers of Ph.D.s almost two and one-half times since 1986--from 205 in 1986 to 303 in 1987 and 497 in 1988. Thus, although students from the PRC only recently began to earn degrees in the United States, their numbers have burgeoned. India and Canada (numbers 3 and 5 on the list), like Taiwan, experienced a more gradual growth (11 percent and 19 percent, respectively).

TABLE D: Countries of Origin of Non-U.S. Citizens Earning Ph.D.s at U.S. Colleges and Universities, 1986-1988 (ranked on number of Ph.D.s)

	Country	Number		Country	Number
1.	Taiwan, Republic of China	2,576	16.	Israel	297
2.	Republic of Korea*	1,959	17.	Hong Kong	296
3.	India	1,826	18.	Turkey	288
4.	People's Republic of China	1,005	19.	Saudi Arabia	282
5.	Canada	963	20.	Jordan	246
6.	Iran	676	21.	Australia	213
7.	Thailand	498	22.	Malaysia	211
8.	Nigeria	485	23.	Pakistan	200
9.	England	451	24.	France	197
10.	Arab Republic of Egypt	402	25.	Italy	192
11.	Japan	384	26.	Indonesia	192
12.	Brazil	383	27.	Venezuela	190
13.	Greece	370	28.	The Philippines	179
14.	Mexico	330	29.	Chile	159
15.	West Germany**	306	30.	Sri Lanka	151

*Includes "Korea, Unspecified." The Democratic People's Republic of Korea (North Korea) does not permit any of its citizens to study in the United States.

**Includes "Germany, Unspecified." The German Democratic Republic (East Germany) does allow exchange students in the United States for partial preparation toward the Ph.D., but the degree is subsequently awarded by the home country institution. Virtually all German recipients of U.S. Ph.D.s are West German.

Gender

In 1973, the peak year for doctorates awarded in the United States, the number of men earning the Ph.D. began a 13-year decline; since 1985, however, men have increased their doctorate production by more than 1,100 degrees, earning 21,666 degrees in 1988. In comparison, women increased both their number and proportion of doctorates in every year from inception of the SED through 1986, after which their number continued to grow (reaching 11,790 in 1988) but their proportion stayed at the 1986 level (about 35 percent). Although a more obvious gender gap existed among foreign doctorates than among U.S. citizens, U.S. women Ph.D.s also remained at their 1986 level of about 41 percent (see Appendix A, Table 5). The proportion of female permanent residents in 1988 (28 percent) decreased somewhat from its peak in 1987 but, in general, has shown an upward trend; the proportion of female temporary residents continued to increase, reaching its highest proportion ever (17 percent) in 1988.

Figure 5 displays trends in numbers of doctorates for men and women, by broad field, for the years 1960-1988; Table E presents numbers of doctorates for the peak year 1973 and the last decade, 1978 to 1988. Since 1960, women have experienced significant gains in fields in which they have been typically underrepresented--such as physical sciences, life sciences, and engineering--and more moderate growth in social sciences and professional/other fields. In humanities and education, the numbers of doctorates earned by women increased until 1978 and 1984, respectively, but have since remained fairly level.

Among men, the numbers of Ph.D.s in the fields of physical sciences, engineering, and life sciences began falling in 1973 after peaking one year earlier. Although they experienced more dramatic declines than life science Ph.D.s, male Ph.D.s in physical sciences have since increased their number nearly to the point of the 1972 peak and male Ph.D.s in engineering have surpassed the peak. The number of male Ph.D.s in life sciences showed a more moderate decline and, with some fluctuation, has remained relatively stable over the last 15 years. In humanities and education, the decrease in the number of men receiving doctorates that began in 1974 continued into the 1980s; however, while the number in humanities has stabilized over the last five years, the number in education has further decreased. The decline among men in social sciences and professional/other fields started later in the 1970s. Social sciences has continued its downward trend, but professional/other fields has recovered and shown growth in the last two years.

It is evident from both Figure 5 and Table E that the gender gap has narrowed in all fields, in some cases because women increased their numbers dramatically, and in other cases because the number of men decreased while the number of women grew. Nevertheless, disparities between the sexes remain marked in certain disciplines. Appendix A, Table 2, shows the percentages of male and female recipients by selected fields in 1988. The data indicate that, despite numerical gains, women were still seriously underrepresented in physical sciences and engineering in 1988 (83 percent male versus 17 percent female in physical sciences, and 93 percent male versus 7 percent female in engineering). In life sciences, women earned 37 percent of all doctorates in 1988, although they outstripped men in the subfield of health sciences, where they constituted 63 percent of Ph.D.s. This proportion was largely the result of the number of women earning Ph.D.s in nursing, a traditionally female-dominated program. Women also outnumbered men in the fields of audiology, speech pathology, public health, and epidemiology (see Appendix A, Table 1 for numbers in each specialty.)

In social sciences, on the other hand, the gap between the numbers of men and women receiving doctorates has narrowed considerably. While in 1960 women received only 13 percent of all social science doctorates (215 Ph.D.s for women versus 1,450 for men), 45 percent of such doctorates in 1988 were awarded to women. This trend toward

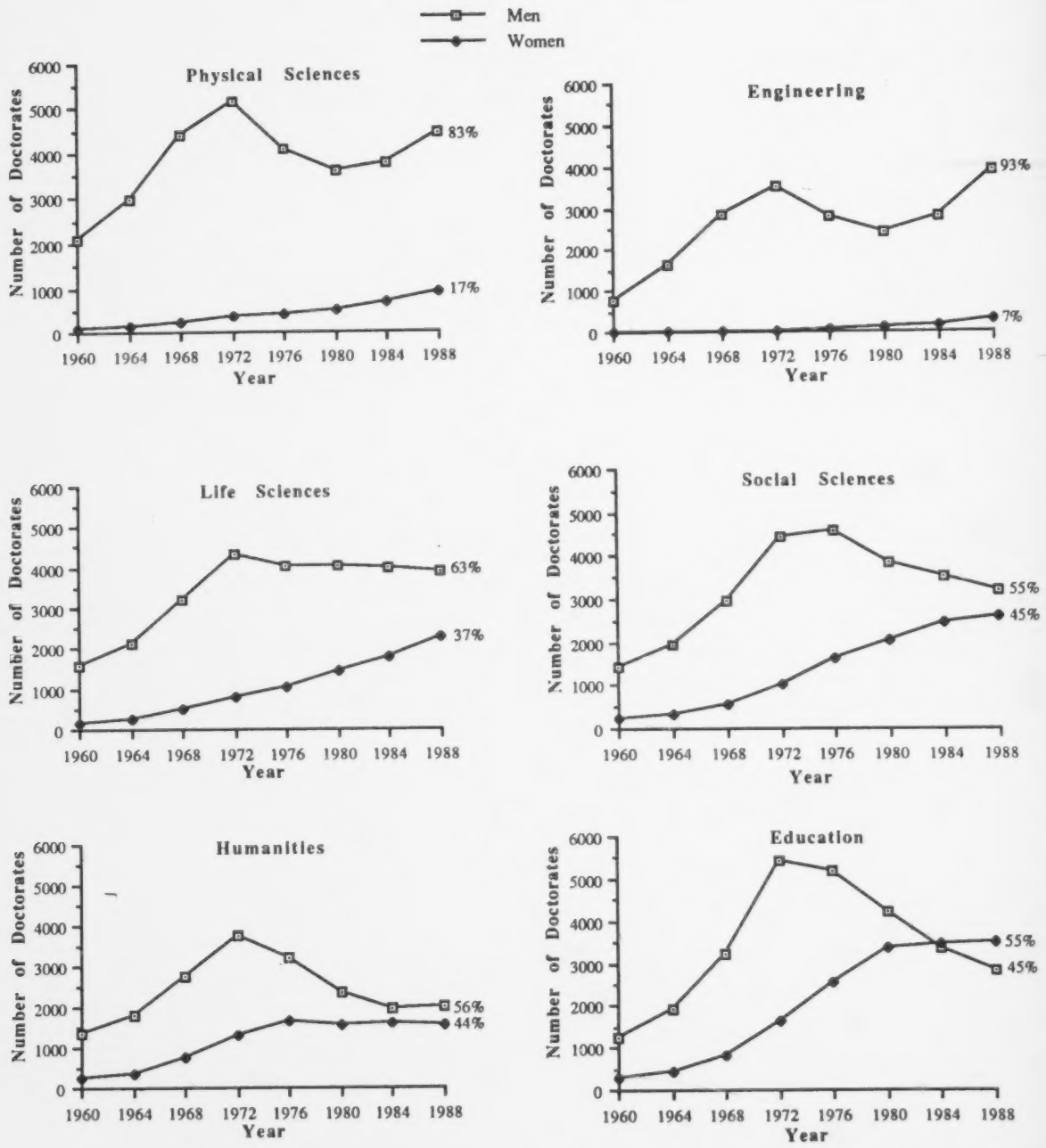

Figure 5. Number of male and female doctorate recipients, by broad field, 1960-1988.

TABLE E: Doctorates Awarded by U.S. Universities, by Broad Field and Sex, 1973 and 1978-1988

Field	Year of Doctorate											
	1973*	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988
Total All Fields	33,755	30,875	31,239	31,020	31,357	31,106	31,280	31,332	31,291	31,896	32,367	33,456
Men	27,670	22,553	22,302	21,613	21,465	21,013	20,747	20,633	20,547	20,590	20,941	21,666
Women	6,085	8,322	8,937	9,407	9,892	10,093	10,533	10,699	10,744	11,306	11,426	11,790
Physical Sciences**	5,311	4,193	4,299	4,111	4,170	4,291	4,426	4,452	4,531	4,807	5,030	5,309
Men	4,929	3,754	3,803	3,609	3,667	3,715	3,809	3,795	3,817	4,033	4,200	4,429
Women	382	439	496	502	503	576	617	657	714	774	830	880
Engineering	3,364	2,423	2,490	2,479	2,528	2,646	2,781	2,913	3,166	3,376	3,712	4,190
Men	3,318	2,370	2,428	2,389	2,429	2,522	2,657	2,762	2,968	3,151	3,470	3,904
Women	46	53	62	90	99	124	124	151	198	225	242	286
Life Sciences	5,167	5,040	5,223	5,461	5,611	5,709	5,553	5,757	5,778	5,734	5,749	6,143
Men	4,245	3,881	3,952	4,047	4,076	4,073	3,832	3,964	3,909	3,786	3,722	3,882
Women	922	1,159	1,271	1,414	1,535	1,636	1,721	1,793	1,869	1,948	2,027	2,261
Social Sciences	5,758	6,039	5,961	5,856	6,142	5,837	6,096	5,930	5,765	5,893	5,797	5,769
Men	4,547	4,178	3,969	3,811	3,945	3,679	3,690	3,504	3,388	3,381	3,301	3,173
Women	1,211	1,861	1,992	2,045	2,197	2,158	2,406	2,426	2,377	2,512	2,496	2,596
Humanities	5,414	4,231	4,141	3,871	3,751	3,561	3,500	3,535	3,428	3,460	3,504	3,553
Men	3,864	2,635	2,549	2,339	2,203	2,051	1,969	1,946	1,939	1,896	1,930	1,979
Women	1,550	1,596	1,592	1,532	1,548	1,510	1,531	1,589	1,489	1,564	1,574	1,574
Education	7,238	7,194	7,385	7,586	7,497	7,251	7,174	6,808	6,734	6,646	6,445	6,349
Men	5,455	4,339	4,277	4,203	3,957	3,712	3,555	3,337	3,243	3,035	2,896	2,842
Women	1,783	2,855	3,108	3,383	3,540	3,539	3,619	3,471	3,491	3,611	3,549	3,507
Professional/Other	1,503	1,755	1,740	1,656	1,658	1,811	1,750	1,937	1,889	1,980	2,130	2,143
Men	1,312	1,396	1,324	1,215	1,188	1,261	1,235	1,325	1,283	1,308	1,422	1,457
Women	191	359	416	441	470	550	515	612	606	672	708	686

*1973 was the peak year for doctorates earned in the United States.

**Includes mathematics and computer sciences.

equality, however, masks sharp disparities that still exist among some social science fields. In 1988, women dominated in psychology (55 percent); but in economics and in political science, men led with 80 percent and 77 percent, respectively, and in other social sciences, men held a 61 percent share.

The gender gap in humanities has also narrowed: in 1988, 44 percent of Ph.D.s in the field were awarded to women, compared to 16 percent in 1960. In subfields of the humanities, women were more numerous in letters and foreign languages and literature (56 percent and 58 percent, respectively), while men predominated in history (64 percent) and other humanities (61 percent).

Education was the only broad field where women were more numerous than men: in 1988, 55 percent of education doctorates were earned by women. This continued a trend begun in the early 1970s, when the number of male education doctorates dropped from about 5,500 in 1972 to less than 3,000 in 1988, and the number of women rose from 1,500 to just over 3,500. However, in 1988 as in 1987, the number of degrees earned in this field decreased for both men and women.

Race/Ethnicity

The representation of minorities in the Ph.D. population continues to be an important issue. A comparison of the racial/ethnic profile of the 1988 doctorates to rough estimates from the 1980 census indicates that American Indians, blacks, and Hispanics are underrepresented relative to their proportions in the general population, and Asians and whites are overrepresented.[1] Table F displays racial/ethnic data from the SED by citizenship group and gender; U.S. citizens and permanent residents (n=24,323 with known race/ethnicity) comprise the population closest to that counted by the Census Bureau.[2]

As can be seen in Table F, the underrepresented groups of American Indians and Hispanics have been slowly growing in doctorate production since 1978, although both groups declined somewhat this past year. In 1978, 60 U.S. or permanent-resident American Indians[3] earned Ph.D.s (0.2 percent of the cohort); in 1987, they peaked at 115 (0.5 percent). This year, however, American Indians declined to 93 doctorates (just under 0.4 percent of the cohort). The 538 Hispanics graduated in 1978 represented 2.1 percent of all U.S. and permanent-resident doctorates in that year. Hispanics also reached their peak in 1987, with 710 Ph.D.s, or 3.0 percent of the cohort. This group, too, suffered a slight decline in 1988, falling to 693 doctorates (2.8 percent). As Table F shows, the upward trend through 1987 for Hispanic and American Indian Ph.D.s was primarily a function of the increase in female doctorates. The decline in 1988 for Hispanics was due to a decrease in the number of women, whereas for American Indians, there was an equal decline in the number of men and women.

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[1] A direct comparison of racial/ethnic Ph.D. groups with their percentages in the U.S. population cannot be made because the Census Bureau collects ethnic data in a way that is not comparable with the SED's data. The 1980 census indicated that American Indians were 1 percent of the population, blacks were 12 percent, Hispanics were 6 percent, Asians were 2 percent, and whites were 83 percent; the percentages add to greater than 100 percent because sometimes Hispanics were double-counted as blacks or whites.

[2] Bureau of the Census, 1980 Census (PC80-1-B1). Washington, D.C.: U.S. Government Printing Office, 1983, Chart 43: "Persons by Age, Race, Spanish Origin and Sex: 1980," pp.27-36.

[3] In most cases, non-U.S. American Indians are citizens of Canada or of Latin American Countries.

TABLE F: Doctorate Recipients, by Gender, Race/Ethnicity, and Citizenship, 1978-1988

Race/Ethnicity	Year of Doctorate										
	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988
TOTAL MEN AND WOMEN*	30,875	31,239	31,020	31,357	31,106	31,280	31,332	31,291	31,896	32,367	33,456
U.S.	25,291	25,464	25,221	25,061	24,388	24,358	24,026	23,363	23,081	22,991	23,172
Permanent Visas	1,344	1,320	1,291	1,281	1,228	1,275	1,224	1,324	1,432	1,578	1,611
Temporary Visas	3,421	3,587	3,644	3,940	4,204	4,499	4,830	5,229	5,275	5,609	6,176
American Indian*	61	84	75	85	77	82	74	95	100	116	93
U.S.	60	81	75	85	77	81	74	95	99	115	93
Permanent Visas**	-	-	-	-	-	1	-	-	-	-	-
Temporary Visas**	1	3	-	-	-	-	-	-	1	1	-
Asian*	2,394	2,602	2,621	2,711	2,904	3,124	3,394	3,642	3,728	4,126	4,771
U.S.	390	428	458	465	452	492	512	516	531	542	612
Permanent Visas	642	674	644	608	552	551	507	553	528	625	621
Temporary Visas	1,311	1,463	1,472	1,564	1,829	2,006	2,295	2,526	2,645	2,933	3,510
Black*	1,384	1,445	1,445	1,491	1,526	1,382	1,494	1,440	1,270	1,217	1,246
U.S.	1,033	1,056	1,032	1,013	1,047	922	953	912	823	767	805
Permanent Visas	73	58	74	97	96	83	102	131	126	139	146
Temporary Visas	270	320	331	372	373	363	419	395	313	305	289
Hispanic*	842	900	821	931	920	969	918	1,001	1,056	1,056	1,045
U.S.	473	462	412	464	535	539	536	561	572	619	594
Permanent Visas	65	77	73	62	79	69	71	73	107	91	99
Temporary Visas	289	348	328	389	294	342	300	361	372	338	346
White*	23,754	23,682	23,805	23,926	23,657	23,831	23,399	22,874	22,767	22,709	23,053
U.S.	21,811	21,920	21,993	21,980	21,677	21,699	21,349	20,757	20,626	20,470	20,685
Permanent Visas	531	476	468	490	463	545	514	534	596	654	668
Temporary Visas	1,372	1,263	1,331	1,432	1,458	1,539	1,493	1,567	1,505	1,563	1,676
Unknown Race/Ethnicity*	2,440	2,526	2,253	2,213	2,022	1,892	2,053	2,239	2,975	3,143	3,248
U.S.	1,524	1,517	1,251	1,054	600	625	602	522	430	478	383
Permanent Visas	33	35	32	24	38	26	30	33	75	69	77
Temporary Visas	178	190	182	183	250	249	323	380	439	469	355

*Totals for racial/ethnic groups include doctorates with unknown citizenship status.
**In most cases, non-U.S. American Indians are citizens of Canada or of Latin American countries.

TABLE F (Continued)

Race/Ethnicity	Year of Doctorate										
	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988
MEN*	22,553	22,302	21,613	21,465	21,013	20,747	20,633	20,547	20,590	20,941	21,666
U.S.	17,936	17,580	16,875	16,360	15,559	15,119	14,729	14,217	13,633	13,581	13,667
Permanent Visas	1,052	1,014	972	973	915	953	892	999	1,067	1,117	1,158
Temporary Visas	2,966	3,092	3,154	3,387	3,621	3,872	4,132	4,395	4,414	4,722	5,120
American Indian*	51	59	46	56	44	51	54	39	59	63	51
U.S.	50	56	46	56	44	50	54	39	58	62	51
Permanent Visas**	-	-	-	-	-	1	-	-	-	-	-
Temporary Visas**	1	3	-	-	-	-	-	-	1	1	-
Asian*	1,972	2,158	2,151	2,223	2,355	2,542	2,780	2,945	3,041	3,349	3,838
U.S.	287	311	313	315	281	312	338	329	348	369	413
Permanent Visas	531	564	513	499	444	431	389	437	417	455	457
Temporary Visas	1,114	1,253	1,282	1,341	1,567	1,731	1,982	2,137	2,258	2,505	2,949
Black*	903	898	871	924	911	833	903	851	706	701	686
U.S.	584	551	499	499	483	413	427	379	322	317	311
Permanent Visas	65	52	63	80	81	73	81	117	106	118	121
Temporary Visas	252	288	305	339	340	339	382	354	275	261	249
Hispanic*	631	678	592	657	650	635	621	646	666	678	678
U.S.	317	308	256	275	344	288	314	300	303	333	321
Permanent Visas	52	52	48	47	52	45	47	50	71	50	65
Temporary Visas	251	310	280	321	247	288	252	294	289	288	287
White*	17,175	16,660	16,311	16,035	15,575	15,308	14,771	14,457	13,956	13,887	14,082
U.S.	15,573	15,261	14,848	14,459	13,987	13,609	13,170	12,805	12,303	12,172	12,296
Permanent Visas	379	319	326	331	309	381	350	367	410	441	448
Temporary Visas	1,197	1,068	1,130	1,225	1,242	1,287	1,226	1,272	1,214	1,258	1,323
Unknown Race/Ethnicity*	1,821	1,849	1,642	1,570	1,478	1,378	1,504	1,609	2,162	2,263	2,331
U.S.	1,125	1,093	913	756	420	447	426	365	299	328	275
Permanent Visas	25	27	22	16	29	22	25	28	63	53	67
Temporary Visas	151	170	157	161	225	227	290	338	377	409	312

WOMEN*	8,322	8,937	9,407	9,892	10,093	10,533	10,699	10,744	11,306	11,426	11,790
U.S.	7,355	7,884	8,346	8,701	8,829	9,239	9,297	9,146	9,448	9,410	9,505
Permanent Visas	292	306	319	308	313	322	332	325	365	461	453
Temporary Visas	455	495	490	553	583	627	698	834	861	887	1,056
American Indian*	10	25	29	29	33	31	20	56	41	53	42
U.S.	10	25	29	29	33	31	20	56	41	53	42
Permanent Visas**	-	-	-	-	-	-	-	-	-	-	-
Temporary Visas**	-	-	-	-	-	-	-	-	-	-	-
Asian*	422	444	470	488	549	582	614	697	687	777	933
U.S.	103	117	145	150	171	180	174	187	183	173	199
Permanent Visas	111	110	131	109	108	120	118	116	111	170	164
Temporary Visas	197	210	190	223	262	275	313	389	387	428	561
Black*	481	547	574	567	615	549	591	589	564	516	560
U.S.	449	505	533	514	564	509	526	533	501	450	494
Permanent Visas	8	6	11	17	15	10	21	14	20	21	25
Temporary Visas	18	32	26	33	33	24	37	41	38	44	40
Hispanic*	211	222	229	274	270	334	297	355	390	378	367
U.S.	156	154	156	189	191	251	222	261	269	286	273
Permanent Visas	13	25	25	15	27	24	24	23	36	41	34
Temporary Visas	38	38	48	68	47	54	48	67	83	50	59
White*	6,579	7,022	7,494	7,891	8,082	8,523	8,628	8,417	8,811	8,822	8,971
U.S.	6,238	6,659	7,145	7,521	7,690	8,090	8,179	7,952	8,323	8,298	8,389
Permanent Visas	152	157	142	159	154	164	164	167	186	213	220
Temporary Visas	175	195	201	207	216	252	267	295	291	305	353
Unknown Race/Ethnicity*	619	677	611	643	544	514	549	630	813	880	917
U.S.	399	424	338	298	180	178	176	157	131	150	108
Permanent Visas	8	8	10	8	9	4	5	5	12	16	10
Temporary Visas	27	20	25	22	25	22	33	42	62	60	43

*Totals for racial/ethnic groups include doctorates with unknown citizenship status.
**In most cases, non-U.S. American Indians are citizens of Canada or of Latin American countries.

Meanwhile, blacks recovered somewhat from their low point in 1987, returning to the level held in 1986. The number of black recipients (U.S. citizens and permanent residents) increased from 906 doctorates in 1987 to 951 in 1988 (3.9 percent of the cohort). Nevertheless, blacks have still experienced a decline of 14 percent since 1978, when they earned 1,106 doctorates (4.4 percent of the cohort). This decline was a result of the steadily falling numbers of U.S. citizen black men earning the Ph.D.; in 1988 this group dropped to 311 doctorates, its lowest level of the decade. Thus, the small recovery seen in 1988 was due solely to an increase in the number of black women Ph.D. recipients (U.S. citizens and permanent residents), to 519 in 1988 (2.1 percent of the cohort), although black women were still fewer in number than during the peak years 1980-1985. The downward trend in doctorate production for U.S. black men shows no sign of ebbing and can be expected to continue, reflecting declining college enrollments for this group in recent years. According to a recent report by the American Council on Education, the number of black men enrolled in U.S. colleges decreased from 470,000 to 436,000 between 1976 and 1986, and their proportion of total enrollments fell from 4.3 percent to 3.5 percent.[4] At the same time, overall college enrollments increased by more than a million. The decrease in the number of black men enrolled in college was the largest decline in college participation for any racial/ethnic group. This is particularly noteworthy since black students have been completing high school at an increasing rate (76 percent in 1986 versus 68 percent in 1976). Black women, on the other hand, have maintained their 5 percent proportion of college enrollments since 1976.

Racial data are frequently requested for U.S. citizens alone; for this reason, Figure 6 displays the changes in proportionate minority shares of the U.S. doctorate population over the period 1978-1988. The results are much the same as when combined with permanent residents, except for the Asian group: Asian Americans constituted a smaller percentage of the U.S. cohort than the overall doctorate population.

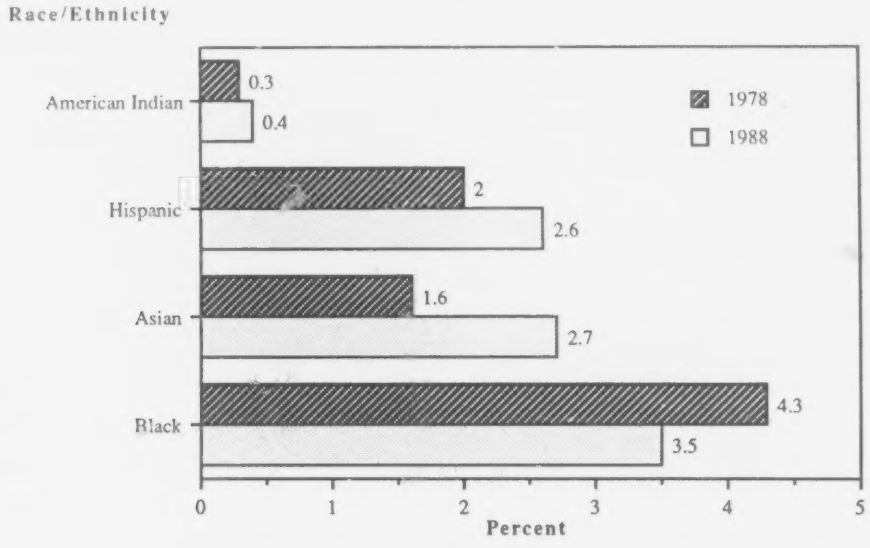

Figure 6. Percentage of doctorates earned by U.S. minorities, 1978 and 1988.

[4] Deborah Carter and Reginald Wilson, *The 7th Annual Status Report on Minorites in Higher Education*, Washington, D.C.: American Council on Education, 1988, p.22.

As Table G shows, the largest share of U.S. minorities (except Asians) earned their doctoral degrees in the field of education in 1988: 26 percent of Hispanics, 38 percent of American Indians, and 46 percent of blacks. The second most frequently chosen field for these three groups was social sciences: 22 percent of Hispanics, 13 percent of American

TABLE G: Race/Ethnicity and Major Field of Doctorate Recipients, 1988 (U.S. Citizens)

Field of Doctorate	Total U.S.*	American Indians	Asians	Blacks	Hispanics	Whites
Total All Fields	22,789	93	612	805	594	20,685
Physical Sciences	3,136	11	111	32	69	2,913
Physics/Astronomy	689	1	19	11	13	645
Chemistry	1,343	5	47	17	43	1,231
Earth, Atmos. & Marine Sci.	496	2	8	2	8	476
Mathematics	331	2	17	1	3	308
Computer Sciences	277	1	20	1	2	253
Engineering	1,734	4	141	19	43	1,527
Life Sciences	4,319	18	127	71	84	4,019
Biological Sciences	3,070	6	100	36	61	2,867
Health Sciences	642	5	16	25	10	586
Agricultural Sciences	607	7	11	10	13	566
Social Sciences (incl. Psych.)	4,252	12	85	158	133	3,864
Psychology	2,611	7	37	96	89	2,382
Anthropology	254	2	3	5	10	234
Economics	421	0	22	11	8	380
Poli. Sci. & Int'l. Relat.	261	0	4	7	6	244
Sociology	311	2	8	14	13	274
Other Social Sciences	394	1	11	25	7	350
Humanities	2,743	7	37	77	94	2,528
History	488	1	10	8	13	456
Amer. & English Lang. & Lit.	906	3	11	26	21	845
Foreign Lang. & Lit.	273	0	5	3	46	219
Other Humanities	1,076	3	11	40	14	1,008
Education	5,214	35	82	370	152	4,575
Teacher Education	375	3	8	31	10	323
Teaching Fields	776	2	10	49	25	690
Other Education	4,063	30	64	290	117	3,562
Professional/Other	1,391	6	29	78	19	1,259
Business & Management	598	4	16	16	4	558
Communications	184	0	1	10	2	171
Other Professional Fields	582	2	12	52	13	503
Other Fields	27	0	0	0	0	27

*Includes only doctorates whose citizenship status and racial/ethnic group are known.

Indians, and 20 percent of blacks. The majority of these social science doctorates were concentrated in psychology. Among Asian Americans, the most frequent field choice was engineering, where 141 out of 612 received their degrees (23 percent), followed by life sciences (21 percent), with most doctorates concentrated in the biological sciences.

The major U.S. baccalaureate institutions for the racial/ethnic groups of 1986-1988 doctorates are presented in Table H. The University of California-Berkeley topped the list for white recipients. The greatest number of Hispanics received their baccalaureates from the University of Puerto Rico. Most programs serving large numbers of Asians were found in the West: four in California, one in Washington, and one in Hawaii. Of the schools from which blacks received their baccalaureates, Howard University topped the list, and all but Wayne State were "traditionally black institutions" (TBIs).[5]

TABLE H: Baccalaureate Institutions of 1986-1988 Ph.D.s, by Race/Ethnicity (ranked on number of Ph.D.s)*

Institution	Number	Institution	Number
Asians		Hispanics	
Univ of California-Berkeley	104	Univ of Puerto Rico-Rio Piedras	232
University of Hawaii-Manoa	102	Univ of Puerto Rico-Mayaquez	62
Univ of California-Los Angeles	63	University of Texas-El Paso	34
Massachusetts Inst Technology	45	University of Texas-Austin	31
Univ of California-Davis	31	Univ of California-Berkeley	30
Stanford University	30	Univ of California-Los Angeles	30
University of Illinois-Urbana	29	University of New Mexico	27
Cornell University	27	University of Miami	25
University of Washington	27	California State Univ-Los Angeles	24
University of Michigan	26	University of Florida	22
Blacks		Whites	
Howard University	81	Univ of California-Berkeley	783
Tuskegee University	50	University of Michigan	716
Morgan State University	41	University of Illinois-Urbana	667
Spelman College	41	Pennsylvania State University	652
Hampton University	38	Cornell University	647
Jackson State University	36	Univ of Wisconsin-Madison	609
Southern University	34	Michigan State University	530
Wayne State University	30	Univ of California-Los Angeles	528
North Carolina Central Univ	30	Ohio State University	500
Univ of the Dist of Columbia	29	Univ of Minnesota-Minneapolis	495

*Because of the small numbers of doctorates awarded to American Indians, baccalaureate institutions for this group are not included.

[5] To be considered a TBI, an institution had to be founded before 1954 for the express purpose of educating blacks, according to Susan T. Hill, *The Traditionally Black Institutions of Higher Education: 1860-1982*, Washington, D.C.: U.S. Department of Education, National Center for Education Statistics, 1985 (out of print).

Parents' Education

Data on the educational level of recipients' parents reveal that 50 percent of new Ph.D.s in 1988 were first-generation college graduates, compared to 58 percent 10 years ago. Within this group, 15 percent of the parents had 1-3 years of college; 22 percent received a high school diploma; 5 percent had some high school; 7 percent attended only grammar school (grades 1 to 8); and 1 percent had no formal education. The remaining half of the 1988 cohort indicated that at least one parent held a college degree (bachelor's degree or higher), compared to 42 percent in 1978: 23 percent of parents had a baccalaureate, 19 percent had a master's degree, and 9 percent had a doctorate.

U.S. citizens were somewhat more likely to come from college-educated families than was the overall cohort. In 1988, 48 percent of this group were first-generation college graduates (compared to 58 percent in 1978). The remaining 52 percent reported at least one parent with a college degree: 22 percent of the parents had a baccalaureate, 21 percent had a master's degree, and 10 percent had a doctorate.

Variation was more pronounced among the U.S. racial/ethnic groups. Data show that the parents of U.S. Asians and whites attained a higher level of education than did parents of the other minority groups in 1988. While 61 percent of Asians and 53 percent of whites reported at least one parent with a college degree, only 41 percent of Hispanics and 30 percent of both blacks and American Indians reported the same. Additionally, Hispanics showed the largest proportion of parents with only a grammar school education (17 percent), and American Indians showed the largest proportion with only a high school education (42 percent). Asians showed the largest proportion of parents with a Ph.D. (13 percent), while blacks showed the smallest proportion (4 percent). Despite these differences, higher levels of parental education were reported in 1988 for each minority group than 10 years earlier. In 1978, college degrees were held by parents of 47 percent of U.S. Asians, 43 percent of whites, 31 percent of Hispanics, and 22 percent of blacks (American Indians in 1978 were too few in number to report).

Time-to-Degree

Two time measures, registered time and total time, can be extracted from the survey's item on educational history (see item 13 of the questionnaire at the back of this report). Registered time-to-degree (RTD) is a net measure of time lapse and is derived by subtracting the years a recipient was not in graduate school between earning a baccalaureate and a Ph.D. Total time-to-degree (TTD) is a gross measure and refers to the number of years elapsed between earning the baccalaureate and the doctorate. Changes in time lapse mean different things for the different measures of time-to-degree. The growth of RTD means that students are spending more time enrolled in graduate school. When TTD grows more than RTD, it means that students are also increasing their time out of graduate school--either by delaying their entrance into a graduate program or by dropping out for some period(s) of time prior to the completion of the program.

By either dimension, time-to-degree has increased approximately 30 percent over the last 20 years, although disaggregated data show that the increases have not been steady and have varied noticeably. Overall, RTD rose from a median 5.3 years in 1968 to 6.9 years in 1988, an all-time high.[6] Figure 7 represents the time line between 1968 and 1988 and shows that RTD was at a low of 5.3 years in 1968 (a dip from the previous year) and then started to increase in 1969. The difference between the low and the high years of RTD

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[6] The median is used as a measure of central tendency rather than the mean because the distribution is skewed.

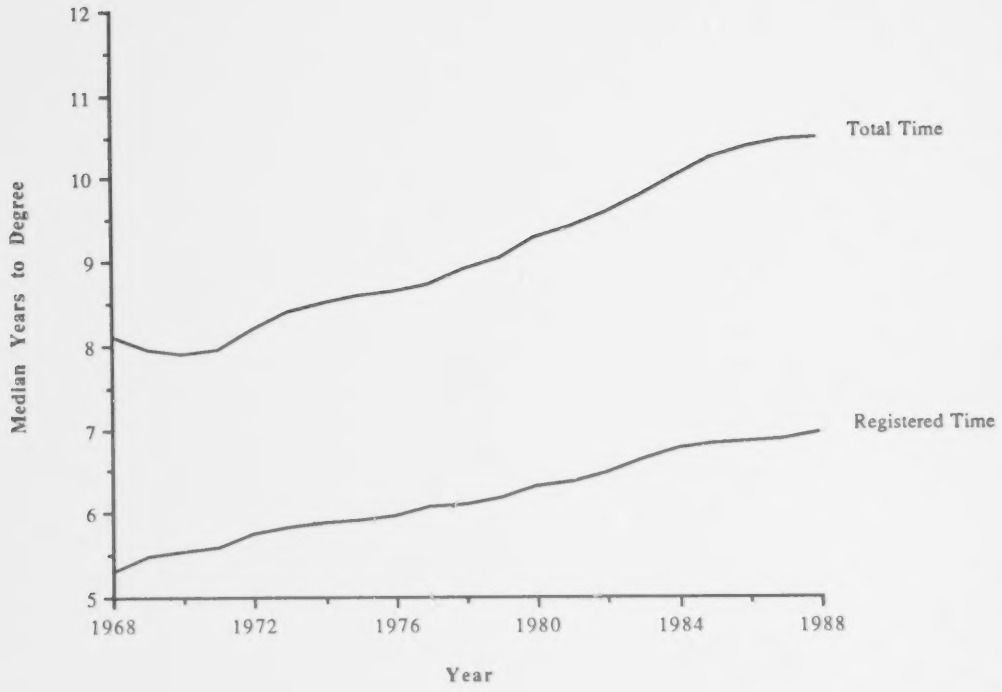


Figure 7. Median years to degree for doctorate recipients, all fields combined, 1968-1988.

represents an increase of 1.6 years. TTD, meanwhile, evidenced a small dip from a median 8.1 years in 1968 to 7.9 years in 1970 and 1971, after which it rose to a high of 10.5 years in 1988. The difference between low and high TTD represents an increase of 2.4 years. Because the increase in TTD was greater than that in RTD, it means that many students were increasing their time not only in school but also out of school.

While all broad fields experienced the basic pattern of lengthening time-to-degree, the source and size of the change varied enormously by field. Table I shows the differences between the broad fields in changing RTD and TTD medians between 1968 and 1988. In general, recipients in social sciences and in the nonsciences experienced longer-than-average time lapses, while natural scientists spent less than the average time earning their degrees.

Over the last 20 years, the median RTD has risen for recipients in all fields. In 1968, the 7 broad fields varied in RTD by no more than 8 months, ranging from 5.1 years for 4 of the fields to 5.8 years for education. By 1988, the spread had widened dramatically, with engineering doctorates showing the shortest RTD at 5.9 years and humanities showing the longest at 8.5 years. The social sciences and nonsciences experienced the greatest lengthening of RTD over the 20-year period, as they also did in TTD.

TABLE I: Median Years to Degree for Doctorate Recipients, by Broad Field, 1968-1988

	Years to Degree										
	1968	1970	1972	1974	1976	1978	1980	1982	1984	1986	1988
Total All Fields											
Registered	5.3	5.5	5.7	5.9	6.0	6.1	6.3	6.5	6.8	6.8	6.9
Total	8.1	7.9	8.2	8.5	8.6	8.9	9.3	9.6	10.0	10.4	10.5
Physical Sci.*											
Registered	5.1	5.3	5.6	5.6	5.6	5.8	5.8	5.8	6.0	6.0	6.1
Total	6.0	6.1	6.5	6.8	6.7	7.0	6.9	6.9	7.2	7.3	7.4
Engineering											
Registered	5.1	5.2	5.5	5.6	5.6	5.6	5.6	5.7	5.7	5.9	5.9
Total	7.1	6.9	7.5	7.6	7.5	7.5	7.6	8.0	8.0	8.1	8.1
Life Sciences											
Registered	5.3	5.3	5.5	5.5	5.6	5.7	5.8	6.0	6.3	6.4	6.5
Total	7.1	6.6	7.0	7.2	7.3	7.3	7.4	7.6	8.2	8.7	8.9
Social Sciences											
Registered	5.1	5.5	5.6	5.7	5.8	6.0	6.4	6.7	7.1	7.2	7.4
Total	7.7	7.3	7.5	7.7	7.8	8.1	8.6	9.2	9.7	10.1	10.5
Humanities											
Registered	5.5	6.1	6.2	6.6	6.9	7.3	7.7	8.0	8.2	8.2	8.5
Total	9.5	9.1	9.0	9.3	9.7	10.2	10.6	11.2	11.5	12.1	12.2
Education											
Registered	5.8	6.2	6.1	6.3	6.3	6.5	6.9	7.2	7.6	7.8	8.1
Total	13.9	12.7	12.5	12.4	12.7	12.7	13.2	13.6	14.6	15.7	16.9
Prof./Other											
Registered	5.1	5.4	5.6	6.0	6.1	6.2	6.4	6.7	7.1	7.3	7.3
Total	10.9	10.2	9.7	9.8	10.3	10.7	11.1	11.6	12.3	12.8	13.0

*Includes mathematics and computer sciences.

Table J presents the differences in RTD and TTD for the various demographic groups. As can be seen, the differences in RTD and especially TTD for all fields combined were quite noticeable, but when the fields were disaggregated, the differences were much smaller.

TABLE J: Median Years to Degree for Doctorate Recipients, by Demographic Group and Broad Field, 1988

	Field of Doctorate							
	All Fields	Phys. Sci.*	Engi-neering	Life Sci.	Social Sci.	Human-ities	Educa-tion	Prof/ Other
RTD Years								
All Ph.D.s	6.9	6.1	5.9	6.5	7.4	8.5	8.1	7.3
Men	6.7	6.2	5.9	6.5	7.3	8.3	8.2	7.3
Women	7.4	6.0	5.8	6.7	7.5	8.7	8.0	7.4
U.S. Citizens	7.2	6.1	5.9	6.6	7.5	8.7	8.3	7.6
Permanent Res.	7.0	6.6	6.2	6.7	8.0	7.5	7.6	7.8
Temporary Res.	6.2	6.1	5.8	6.2	6.8	7.2	6.2	6.4
U.S. Citizens**								
Asians	7.0	6.4	6.1	6.9	7.8	8.5	8.4	8.5
Blacks	8.1	6.5	6.1	6.6	8.1	9.0	8.6	7.8
Hispanics	7.4	6.4	5.8	6.4	7.8	9.4	8.3	7.5
Whites	7.2	6.1	5.8	6.6	7.4	8.7	8.3	7.5
TTD Years								
All Ph.D.s	10.5	7.4	8.1	8.9	10.5	12.2	16.9	13.0
Men	9.7	7.5	8.2	8.6	10.3	11.9	16.5	12.6
Women	12.3	7.3	7.0	9.3	10.9	12.6	17.2	14.0
U.S. Citizens	11.0	7.1	7.5	8.6	10.5	12.5	17.3	14.0
Permanent Res.	10.0	8.6	8.9	10.0	11.2	10.9	12.9	11.6
Temporary Res.	9.3	8.5	8.4	9.7	9.9	10.8	12.9	10.5
U.S. Citizens**								
Asians	9.9	7.9	8.7	8.3	10.5	12.6	19.7	15.0
Blacks	14.9	7.8	8.3	10.4	11.0	14.3	17.9	16.0
Hispanics	10.9	7.1	7.7	7.7	10.0	13.0	16.2	15.0
Whites	10.9	7.0	7.4	8.6	10.5	12.4	17.3	13.8

*Includes mathematics and computer sciences.
**American Indians are not shown because their numerical distribution among fields was too small for averages to be meaningful.

Sources of Support

In 1987 the survey question regarding sources of financial support was changed in two respects from earlier questionnaires. The most significant change was that several new categories were added, allowing respondents to identify more accurately the type of support that they had received. In 1987 the new categories included NSF, NIH, and other federal research assistantship (RA), and foreign (non-U.S.) government support. In 1988, categories for USDA fellowship and RA were added (see item 18 of the survey

questionnaire at the back of this report). The addition of federal RAs has had the effect of reducing the reported number of university RAs. Because of the apparent shifts in distribution, time-series data through 1986 are no longer comparable with the data collected in the last two years, so this report discusses only 1988 data. (A solution for time-series analysis would be to look at RAs as a single type of support mechanism rather than as split between university-related and federal support.)

The second change in this question involved asking respondents to estimate the percentage of support received from each source, rather than just to designate their primary and secondary sources of support as in the past. This allows the analysis of the mean percentage of support from each source, as can be seen in Table K. Although this change also interrupts time-series reporting, it offers the advantage of obtaining more information about the distribution of financial support in graduate school. In this report, data on sources of support in graduate school are presented in two ways: mean percentages of support received by new Ph.D.s from all sources (Table K) and a frequency distribution of doctorates among "primary" sources only (Table L).

As can be seen in Table K, personal sources provided the largest amount of support for new Ph.D.s in 1988, accounting for a mean 43 percent of their total support in graduate school. The university was the next largest supporter, providing 39 percent of all support. Another estimated 10 percent of support came from the federal government and 7 percent from "other" sources (federal support may be understated because additional support provided indirectly through universities is included under "university", and federal loan programs are included under "personal"). Students in some fields relied on certain sources more than those in other fields. In general, doctorates in physical sciences, life sciences, and engineering were mostly supported from university sources, while those in social sciences and the nonsciences obtained most of their support from personal sources: education (75 percent), professional/other (56 percent), social sciences (55 percent), and humanities (50 percent). In contrast, Ph.D.s in physical sciences furnished only 18 percent of their support. University sources, on the other hand, provided 59 percent of the support for physical science doctorates but only 16 percent for education doctorates. University teaching assistantships (TAs) accounted for a mean 17 percent of support across all fields, and university research assistantships (RAs) accounted for another 15 percent (compared to less than 6 percent provided by federal RAs). Doctorates in physical sciences and humanities received more support (over 28 percent) from university TAs than from any other source. University RAs surpassed TAs in other fields--for instance, engineering Ph.D.s received 32 percent and life science Ph.D.s received 20 percent of their support from university RAs (compared to 15 percent and 13 percent for TAs, respectively). However, RAs accounted for a very small percentage of support in humanities (3 percent) and in education (4 percent). This discrepancy probably relates to the profusion of university-sponsored research projects in the natural sciences that can logically use student aid; in the nonscience fields, research is often carried out by individual professors, and few students are needed to assist. In humanities, the gap was partially filled by a relatively large percentage of support from university fellowships (10 percent), about twice that reported by recipients in most other fields.

Table L compares primary sources of support (i.e., the sources with the largest reported percentages), by broad field and demographic group and shows the frequencies reported in 1988. These data are consistent with the mean percentages presented in Table K. Differences among the demographic groups were largely related to field.

Table K: Mean Percentage of Support for Doctorate Recipients, by Source and Broad Field, 1988

Source	Field of Doctorate							
	All Fields	Phys. Sci.*	Engi-neering	Life Sci.	Social Sci.	Human-ities	Educa-tion	Prof/ Other
Federal Total**	10.4	16.8	14.3	20.8	6.1	2.5	2.9	3.5
Research Ass't	5.5	13.7	10.0	8.9	1.7	0.2	0.4	0.4
Fellowship	0.6	1.0	0.8	1.1	0.5	0.1	0.1	0.0
Traineeship	1.9	0.3	0.4	8.3	1.4	0.0	0.1	0.1
Other HHS	0.2	0.0	0.0	0.6	0.3	0.0	0.1	0.2
Title IX-G*POP	0.3	0.3	0.3	0.3	0.4	0.2	0.2	0.3
Other Dept Educ	0.3	0.0	0.1	0.1	0.4	0.8	0.5	0.1
GI Bill	0.5	0.1	0.4	0.2	0.5	0.5	1.0	1.2
Other Fed Suppt	1.2	1.4	2.3	1.3	0.9	0.8	0.7	1.2
University Total	39.2	59.1	52.8	41.8	34.2	42.8	15.5	33.6
Univ Teach Ass't	17.0	28.8	14.5	13.1	16.6	28.1	6.7	17.7
Univ Res Ass't	14.9	24.7	32.2	20.4	9.3	2.6	3.9	8.9
Univ Fellowship	5.2	4.8	4.9	6.2	5.7	9.8	1.8	5.0
Coll Work-Study	0.4	0.2	0.2	0.4	0.6	0.7	0.3	0.2
Other Univ Suppt	1.7	0.7	0.9	1.7	1.9	1.7	2.7	1.7
Personal Total	43.4	17.8	20.8	30.1	55.1	50.3	74.6	55.5
Own Earnings	23.3	7.2	9.9	12.1	25.0	25.5	51.5	31.1
Spouse Earnings	8.6	4.6	3.5	8.5	10.9	11.5	11.1	11.0
Family Contrib	5.2	3.3	5.6	4.5	7.3	6.1	4.4	6.7
Guar Stu Loan	5.3	2.5	1.6	4.4	10.0	5.7	6.4	5.6
NDSL Loan	0.5	0.1	0.1	0.3	1.1	1.0	0.5	0.5
Other Loans	0.5	0.2	0.3	0.3	0.8	0.5	0.8	0.8
Other Total	6.8	6.2	12.0	7.2	4.5	4.3	6.8	7.3
Natl Fellowship	1.1	1.4	1.6	1.0	1.2	1.6	0.4	0.7
Business/Indus	2.2	1.7	4.1	1.3	1.1	0.6	3.9	2.9
Foreign Gov't	2.7	2.5	5.6	4.0	1.6	0.9	1.7	2.3
Other Sources	0.8	0.6	0.7	0.9	0.7	1.2	0.8	1.4

*Includes mathematics and computer sciences.
**Research assistantships include RAs funded by NSF, NIH, and USDA, as well as "other" federal RAs. (RAs funded under federal grants to universities generally fall under "University".) Fellowships represent those funded by NSF and USDA. Traineeships are from NIH. Federal programs such as GSL and NDSL are not included under federal, but appear under "Personal."

TABLE L: Percentage Distribution of Primary Sources of Support for Doctorate Recipients, by Demographic Group, 1988*

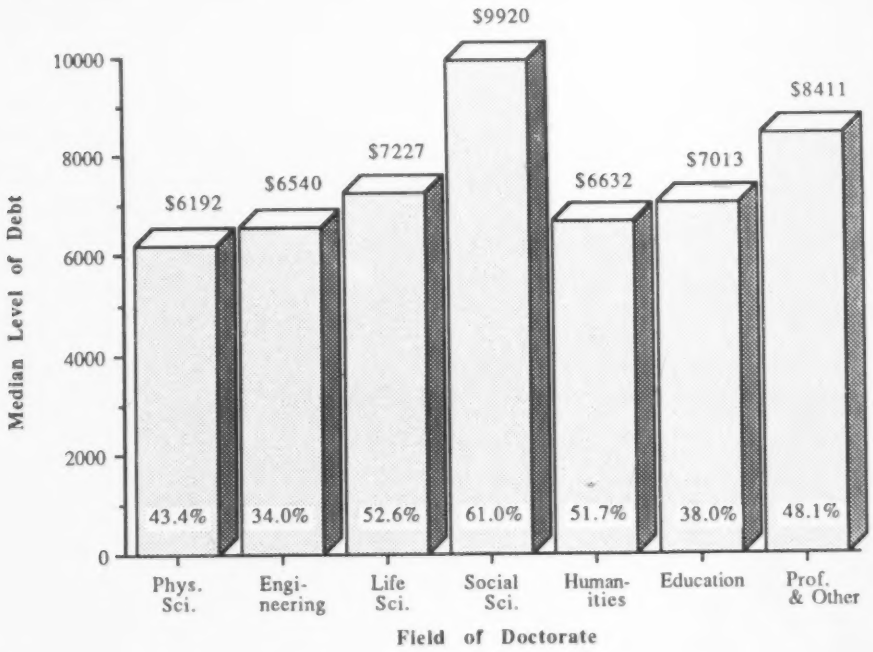
Source of Support	Total	Men	Women	U.S. Citiz.	Perm. Res.	Temp. Res.	U.S. Citizens Am. Ind.	Asian	Black	Hisp.	White
Total All Fields											
Personal	41.8	35.5	53.3	49.0	33.7	15.6	59.0	36.0	59.7	46.4	49.1
University	39.4	43.0	32.9	34.7	50.8	55.2	19.3	40.1	24.1	30.7	35.0
Federal	11.6	13.0	9.0	12.2	7.2	10.1	14.5	18.9	10.3	17.1	12.0
Other	7.2	8.5	4.8	4.1	8.3	19.1	7.2	5.1	5.9	5.8	3.9
Physical Sciences**											
Personal	14.2	14.4	13.0	17.9	12.9	5.8	44.4	15.0	6.7	13.1	18.2
University	60.6	60.2	62.7	56.8	66.8	68.2	33.3	59.0	56.7	45.9	56.7
Federal	19.2	19.2	19.0	21.3	13.4	15.1	22.2	21.0	20.0	32.8	21.2
Other	6.1	6.3	5.3	4.0	6.9	10.8	0.0	5.0	16.7	8.2	3.9
Engineering											
Personal	15.8	16.3	9.5	20.0	20.5	10.3	25.0	21.6	17.6	17.9	19.8
University	54.8	54.7	56.6	47.9	61.7	61.1	25.0	54.4	35.3	43.6	47.6
Federal	16.3	15.8	21.9	20.9	10.4	12.4	25.0	14.4	17.6	30.8	21.3
Other	13.1	13.2	12.0	11.1	7.5	16.3	25.0	9.6	29.4	7.7	11.3
Life Sciences											
Personal	25.7	23.0	30.3	28.9	25.4	11.7	46.7	26.1	28.1	23.1	29.2
University	42.7	44.0	40.3	41.1	48.1	48.1	33.3	27.7	34.4	47.4	41.4
Federal	23.8	23.6	24.0	27.5	12.7	10.7	20.0	43.7	31.3	29.5	26.9
Other	7.9	9.3	5.4	2.5	13.8	29.5	0.0	2.5	6.3	0.0	2.5
Social Sciences											
Personal	55.7	51.5	60.8	60.7	52.1	25.0	70.0	51.4	58.5	57.5	61.1
University	33.3	36.5	29.5	30.2	40.6	51.4	0.0	37.1	25.9	19.2	30.7
Federal	6.1	6.2	6.0	6.7	1.0	3.8	10.0	7.1	12.6	15.8	6.1
Other	4.8	5.8	3.6	2.3	6.3	19.8	20.0	4.3	3.0	7.5	2.0
Humanities											
Personal	49.2	49.3	49.0	52.3	41.0	26.5	80.0	44.8	42.9	50.0	52.6
University	44.8	43.9	45.8	43.1	51.8	56.1	20.0	48.3	38.1	41.7	43.3
Federal	2.3	2.9	1.6	2.2	0.7	3.4	0.0	3.4	6.3	4.2	2.0
Other	3.8	3.8	3.7	2.4	6.5	13.9	0.0	3.4	12.7	4.2	2.0
Education											
Personal	76.5	75.5	77.4	79.5	71.3	42.8	65.7	83.6	78.1	70.4	80.0
University	13.4	11.1	15.4	12.8	18.9	19.0	14.3	10.4	15.7	15.6	12.5
Federal	3.0	3.9	2.2	2.9	1.4	5.3	11.4	3.0	3.1	8.9	2.6
Other	7.1	9.6	5.0	4.9	8.4	32.9	8.6	3.0	3.1	5.2	4.9
Professional/Other											
Personal	53.7	51.6	58.2	61.9	40.5	27.4	60.0	58.3	53.7	56.3	62.6
University	33.7	33.6	34.0	27.8	53.4	49.1	20.0	29.2	20.9	25.0	28.1
Federal	3.7	3.9	3.3	4.5	0.0	2.1	20.0	8.3	17.9	0.0	3.7
Other	8.9	10.9	4.5	5.8	6.0	21.5	0.0	4.2	7.5	18.8	5.6

*A recipient's "primary" source of support is the source with the largest reported percentage. "Personal" includes loans as well as own earnings and contributions from the spouse/family. "Other" includes U.S. nationally competitive fellowships, business/employer funds, foreign government, and other nonspecified sources.
**Includes mathematics and computer sciences.

Indebtedness

The question on indebtedness was added to the survey in 1987 because of a concern that the majority of Ph.D.s are hopelessly encumbered with debt by the time they graduate. Data from the last two surveys do not support this assumption, however. Of the 30,254 respondents to the debt question in 1988, over half (53 percent) reported finishing their doctoral programs with no debt related to their [redacted] education. Of the 14,235 (47 percent) who replied affirmatively, 37 percent owed less than $5,000; 27 percent owed between $5,001 and $10,000; 24 percent owed between $10,001 and $20,000; 9 percent owed between $20,001 and $30,000; and 4 percent owed $30,001 or more. The median level owed for those with accumulated educational debt was approximately $7,500.

Figure 8 displays the percentages of indebted recipients and the median levels of their debts by field. Engineering recipients had the lowest frequency of cumulative debt, with debt reported by 34 percent of the cohort. They were followed by doctorates in education and in physical sciences (38 percent and 43 percent, respectively). These data correspond to the frequency of reported university and federal aid in the fields of physical sciences and engineering, indicating that availability of funds from other sources may be a factor in decisions not to borrow. Of those students who did end their graduate work with debt, these two fields also reported high proportions of students owing $5,000 or less (43 percent in physical sciences and 41 percent in engineering). The median levels of debt were about $6,200 and $6,500, respectively.



NOTE: Doctorate recipients who reported no debt are not included in median levels of debt.

Figure 8. Percentage of doctorate recipients with debt and median level of debt, by broad field, 1988.

The median level of debt for education doctorates ($7,000) was lower than the overall median debt of $7,500, and so was the share of those recipients reporting debt at graduation (38 percent versus 47 percent for doctorates in all fields). This lower level of debt may not be attributed to student support, however. In the case of education doctorates, institutional support was not often reported; rather, a large percentage of education doctorates reported being supported by their own or family resources.

The field reporting the highest percentage of recipients with debt was social sciences, where 61 percent of graduates had accumulated debt at the end of their doctoral programs. This group also had the highest median level of debt--$9,900. In each of the three remaining broad fields, about half the recipients reported debt, but the levels of debt varied: $6,600 in humanities, $7,200 in life sciences, and $8,400 in professional/other fields.

In Table M, percentage and level of debt are displayed by demographic group. When considered by gender, percentages of doctorates with debt were similar for men and women: 47 percent of men and 48 percent of women reported debt. For men, the median level of debt was about $7,300; for women, it was about $7,900. Disaggregated by citizenship, the data show U.S. citizens reporting not only the greatest frequency of debt (55 percent, or more than 2.5 times that of temporary residents), but also much higher debt--$7,600 for U.S. citizens versus $5,500 for non-U.S. citizens with temporary visas. Among U.S. citizens, Asians had the smallest percentage of indebtedness (53 percent), and Hispanics had the largest (66 percent). Hispanics also had the highest median debt ($8,300), contrasted with a low of $7,100 reported by American Indians.

TABLE M: Percentage of Doctorate Recipients with Debt and Median Level of Debt, by Demographic Group, 1988

	Percent With Debt	Median Dollars*
All Ph.D.s	47.1	7,471
Men	46.9	7,258
Women	47.4	7,869
U.S. Citizens	54.7	7,649
Permanent Residents	37.4	7,391
Temporary Residents	20.7	5,470
U.S. Citizens		
American Indians	63.3	7,116
Asians	53.0	7,748
Blacks	60.5	7,655
Hispanics	66.2	8,283
Whites	54.1	7,616

*Doctorate recipients who reported no debt are not included.

POSTGRADUATION PLANS

The postgraduation plans of new doctorate recipients have been of continued interest to employers and researchers, as well as to prospective graduate students, throughout the years. The special section of this report investigates five changes that have taken place in postdoctoral intentions over the past two decades. First, although most new recipients continue to prefer employment opportunities to postdoctoral study, steady movement toward further education has been observed. Second, non-U.S. citizens with doctoral degrees earned in the United States have opted more and more to remain in this country after graduation, at least temporarily, both for employment and study. Third, among Ph.D.s planning employment in the United States, the proportion taking jobs in sectors other than academe has grown significantly. Fourth, although teaching still engages the largest share of new doctorates in the U.S. labor force, it has declined dramatically as the work activity of choice. Finally, while the majority of employed new Ph.D.s are working in their doctorate field, the proportion planning to work in a field other than the doctorate specialty has increased since 1968.

Postgraduation Status

By the time they completed the survey questionnaire, 73 percent of new doctorate recipients in 1988 had definite commitments for either employment (54 percent) or study (19 percent). Almost half of those with employment commitments were returning to positions they held before graduation. However, education was the only broad field with a majority returning to previous employment; three times as many education doctorates returned to former positions as found new ones. The remaining 27 percent of new doctorate recipients in 1988 were "seeking" postgraduation opportunities; 20 percent sought employment and 7 percent sought postdoctoral study appointments. About one-third of the "seekers," however, were negotiating with one or more organizations. Because recipients sometimes complete the survey questionnaire well ahead of graduation and it is not possible to determine the final status of the "seekers," the remainder of the discussion on postdoctoral plans focuses only on those Ph.D.s with known commitments at the time of survey completion.

Employment versus Study Commitments

Table N shows the percentage distribution of employment and study commitments for Ph.D.s in 1968, 1978, and 1988, by demographic group and field of doctorate. Across all fields in 1988, 16,106 doctorates (74 percent of recipients with definite commitments) planned employment, and 5,774 (26 percent) planned study--the latter representing an increase of more than 13 percentage points since 1968. Each of the last two decades experienced about the same amount of proportionate growth in study plans, perhaps

Table N: Postgraduation Commitments of Doctorate Recipients, by Demographic Group and Major Field, 1968, 1978, and 1988*

	1968		1978		1988	
	Empl	Study	Empl	Study	Empl	Study
Total Ph.D.s	16,512	2,454	16,611	4,071	16,106	5,774
%	87.1	12.9	80.3	19.7	73.6	26.4
Men	87.2	12.8	79.2	20.8	71.7	28.3
Women	86.1	13.9	83.7	16.3	77.1	22.9
U.S. Citizens	88.1	11.9	81.0	19.0	75.7	24.3
Permanent Residents	86.1	13.9	78.3	21.7	72.0	28.0
Temporary Residents	77.6	22.4	75.8	24.2	64.7	35.3
U.S. Citizens						
American Indians	NA	NA	90.2	9.8	82.3	17.7
Asians	NA	NA	74.7	25.3	70.0	30.0
Blacks	NA	NA	94.0	6.0	88.1	11.9
Hispanics	NA	NA	90.3	9.7	73.7	26.3
Whites	NA	NA	80.6	19.4	75.6	24.4
Physical Sciences	76.5	23.5	60.5	39.5	51.3	48.7
Physics/Astronomy	74.6	25.4	45.2	54.8	32.1	67.9
Chemistry	67.0	33.0	50.8	49.2	42.1	57.9
Earth, Atmos. & Marine Sci.	88.4	11.6	70.7	29.3	61.2	38.8
Mathematics	93.9	6.1	87.0	13.0	77.7	22.3
Computer Sciences	NA	NA	89.7	10.3	88.5	11.5
Engineering	94.2	5.8	84.8	15.2	80.2	19.8
Life Sciences	64.9	35.1	47.3	52.7	39.4	60.6
Biological Sciences	57.3	42.7	30.9	69.1	22.5	77.5
Health Sciences	86.3	13.8	83.1	16.9	82.0	18.0
Agricultural Sciences	89.5	10.5	88.6	11.4	73.2	26.8
Social Sciences (incl. Psych.)	92.4	7.6	87.0	13.0	84.2	15.8
Humanities	98.1	1.9	95.2	4.8	93.1	6.9
Education	98.1	1.9	97.7	2.3	95.6	4.4
Professional/Other	98.3	1.7	98.4	1.6	97.5	2.5

*Percentages are based on responses to postgraduation plans. Only doctorates with definite commitments are included.

because of a combination of four factors: increased doctorate production in certain fields; a surge in the number of temporary residents earning doctorates in the United States and remaining here after graduation; fewer employment opportunities in some areas; and employer requirements for a year or more of postdoctoral experience in addition to the doctorate.

The movement towards continued education was observed in all broad fields but was most pronounced in the physical and life sciences, especially in physics/astronomy and biological sciences. In 1988, the proportion of physical science Ph.D.s with study plans (49 percent) was almost as large as that for employment (51 percent), and life science Ph.D.s as a whole favored study opportunities (61 percent). In contrast, only 24 percent of physical science Ph.D.s and 35 percent of life science Ph.D.s planned study in 1968. Subfields within life sciences, however, showed some variation in 1988; while the vast majority of Ph.D.s in biological sciences chose study, Ph.D.s in both health sciences and agriculture planned employment. Nevertheless, of these fields, agriculture experienced the greatest growth in study plans, increasing its share two and one-half times since 1968.

Disaggregation of the data by demographic group reveal a consistent pattern--that is, most Ph.D.s planned employment, but a shift toward postdoctoral study was noticeable. Differences in preference for employment versus study between men and women were small for all three data points. Although a slightly larger proportion of women than men planned employment in 1988, the percentage planning study has grown substantially for both groups since 1968 (from 13 percent to 28 percent for men; from 14 percent to 23 percent for women). All citizenship groups favored employment as well, but temporary residents showed significant movement toward study during the last 10 years: their share with study commitments jumped 11 percentage points, from 24 percent in 1978 to 35 percent in 1988. Of the U.S. racial/ethnic groups, blacks were the most likely to plan employment in 1988 (88 percent). U.S. Asians were the most likely to continue their education (30 percent), followed closely by Hispanics (26 percent), who increased their proportion threefold in the last 10 years. It should be noted that many of these observations were field-related. The demographic groups showing the largest proportions planning study were concentrated in fields where postdoctoral study was common and support opportunities were readily available.

Postdoctoral Location of Doctorate Recipients

Over the past 20 years, the proportion of new Ph.D.s planning to remain in the United States after graduation has changed little despite an increase in the number and proportion of non-U.S. citizens earning doctorates in this country. This means that more non-U.S. citizens have decided to stay on after graduation, at least temporarily. In 1988, 90 percent of all recipients with known postgraduation commitments and location intended to stay in the United States, while 10 percent planned to leave: of the 18,358 new Ph.D.s staying in this country, there were 15,698 U.S. citizens, 697 permanent residents, 1,944 temporary residents, and 19 with unknown citizenship status. As Figure 9 shows, U.S. citizens had the highest "stay" rate (98 percent), followed by permanent residents (85 percent) and temporary residents (56 percent). However, while the proportion of U.S. citizens has grown slightly and permanent residents decreased somewhat since 1968, the proportion of temporary residents electing to stay in the United States after graduation has increased significantly from 45 percent (or 743) to 56 percent (or 1,944) over the past 20 years. This increase appears even more dramatic when the change over the last decade is examined. By 1978, the percentage of temporary residents remaining in this country had dropped to 39 percent (although their number had increased somewhat to 828), but over the next 10 years, their percentage jumped 17 points to its current level of 56 percent.

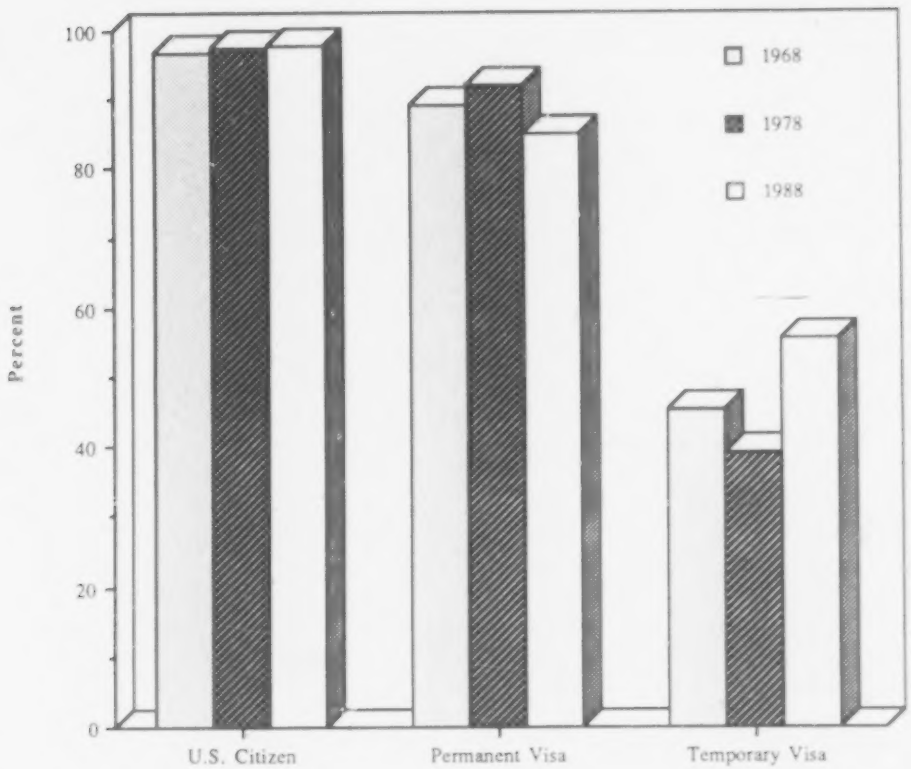


Figure 9. Percentage of doctorate recipients planning to remain in the United States after graduation, by citizenship status, 1968 to 1988.

Table O displays the postdoctoral location and plans of non-U.S. citizen Ph.D.s in 1988, by major field of doctorate and visa status. While permanent residents staying in the United States in 1988 favored employment over study opportunities by a ratio of almost 3:1, the majority of temporary residents staying planned to continue their studies. (This may occur because temporary residents are generally not eligible to accept permanent jobs in the United States.) Temporary residents have shown a steady movement from employment to study in this country since 1968, when only 38 percent of those staying planned to further their education. By 1978 this percentage was 48 percent, and by 1988 it was 52 percent. The reader is also referred to the discussion of employment commitments in the United States beginning on page 39.

Table O: Postdoctoral Location of Non-U.S. Citizen Doctorate Recipients with Postgraduation Commitments, by Visa Status and Major Field, 1988*

Field of Doctorate		Postdoctoral Location							
		Permanent Visas				Temporary Visas			
		U.S. Location		Foreign Location		U.S. Location		Foreign Location	
		Empl	Study	Empl	Study	Empl	Study	Empl	Study
All Fields	%	62.4	22.5	10.2	4.9	26.4	29.1	37.8	6.6
Physical Sciences		51.4	36.8	3.5	8.3	20.9	49.2	19.3	10.6
Physics/Astronomy		28.9	55.3	0.0	15.8	8.7	63.0	9.4	18.9
Chemistry		39.5	47.4	5.3	7.9	7.8	74.6	12.4	5.3
Earth, Atmos. & Marine		37.5	37.5	6.3	18.8	4.3	31.9	50.7	13.0
Mathematics		70.8	20.8	8.3	0.0	40.6	17.1	30.0	12.4
Computer Sciences		89.3	10.7	0.0	0.0	62.5	13.4	23.2	0.9
Engineering		78.0	11.0	8.1	2.9	39.3	27.3	29.7	3.8
Life Sciences		24.7	57.1	10.6	7.6	4.8	43.2	45.1	6.9
Biological Sciences		15.4	75.2	1.7	7.7	4.1	63.0	26.6	6.3
Health Sciences		73.3	13.3	13.3	0.0	10.8	24.3	60.8	4.1
Agricultural Sciences		34.2	18.4	36.8	10.5	4.0	17.2	70.0	8.8
Social Sci. (incl. Psych.)		77.5	8.8	9.8	3.9	38.1	7.5	49.2	5.2
Humanities		87.1	1.2	10.6	1.2	43.4	3.2	46.6	6.9
Education		62.9	5.7	25.7	5.7	6.0	4.7	80.0	9.4
Professional/Other		83.1	2.6	13.0	1.3	47.0	2.8	48.6	1.6

*Percentages are based on responses to postgraduation plans and location. Only doctorates with definite commitments are included.

Doctorates from some countries were more inclined to remain in the United States in 1988 than were those from other countries. In general, citizens of the European and Asian continents, as well as Canada and the Caribbean Islands, planned to stay in this country, while those from Central and South America, Africa, and Australia planned to leave. Nevertheless, there were differences within regions. For example, data on Eastern Asian Ph.D.s show that those from the People's Republic of China, Taiwan, and Hong Kong were heavily inclined toward remaining in the United States; those from Japan and Korea less so; and those from Malaysia, Singapore, and Thailand returned home. Although most doctorates from Western Asia stayed in this country, Ph.D.s from Iraq, Jordan, Kuwait, Nepal, Saudi Arabia, and Syria planned to leave. Variations also exist for Ph.D.s from Northern Europe: individuals from the Commonwealth countries and Sweden most often decided to stay here, but those from Norway and Finland returned home.

In all, 30 percent of non-U.S. citizens who earned doctorates in the United States in 1988 planned to return to their native countries and another 9 percent had commitments in foreign countries other than their own. In an effort to determine why doctorates from some countries were much more likely to return home than others, the data were disaggregated by primary source of graduate support. It was thought that the level of support received from the home government might be a determining factor in a recipient's decision to return home: if the government was the primary source of support, the doctorate might be obligated to meet a payback requirement. Results from this inquiry were mixed. For Brazil, Norway, Malaysia, Saudi Arabia, Egypt, and Libya, over 70 percent of the doctorates with plans to return did receive their primary support from the home government; furthermore, of those receiving government support, almost all returned home upon graduation. On the other hand, Portugal, Japan, and Australia showed large proportions going home, yet less than 25 percent of the returnees were primarily supported by their governments.

Field of doctorate was also examined in relation to postdoctoral location. For all doctorates in 1988, the broad fields with the highest "stay" rates were education (93 percent) and social sciences and humanities (92 percent for each), all fields where U.S. citizens were predominant. A few subfields showed even higher percentages: psychology (98 percent), communications (96 percent), and chemistry (94 percent), the latter despite foreign citizens comprising one-fourth of its doctorates. The broad fields whose doctorate recipients were most likely to leave were those in which foreign citizens concentrated: engineering (16 percent), life sciences (12 percent), and physical sciences (11 percent). The life sciences subfield of agriculture showed the largest proportion of doctorates leaving the United States (32 percent); but then, non-U.S. citizens accounted for 40 percent of all agriculture doctorates in 1988. It is also worth noting that while most exits from the United States were a result of the large number of non-U.S. citizens earning degrees in this country, American citizens contributed to the outflow as well, if only temporarily for further study. Although only 2.4 percent of U.S. citizen Ph.D.s overall expected to leave the United States in 1988, a few fields showed proportions 2-3 times that size: physics/astronomy (7 percent), earth/atmospheric/marine sciences (6 percent), anthropology (5 percent), and agriculture (4 percent)--all with the largest share planning further study.

Study Commitments

This discussion focuses only on those Ph.D.s with known commitments at the time of survey completion. In 1988, 5,774 doctorates (26 percent of recipients with definite commitments) planned further study after graduation, compared to 4,071 (20 percent) in 1978 and 3,438 (16 percent) in 1970. (The earliest year used for comparisons in this section is 1970 because of changes in the survey questions over the years.)

Mechanism of Support

Table P shows postdoctoral study commitments by mechanism of support, demographic group, and broad field of doctorate for 1988. Postdoctoral fellowships accounted for 51 percent of all study commitments in 1988, followed by research associateships (40 percent), and traineeships (4 percent). Another 6 percent of Ph.D.s planning study had "other" commitments for continued education. Fellowship support steadily declined from 56 percent of all study commitments in 1970 to 51 percent in 1988. The proportion of research associateships, on the other hand, increased from 36 percent to 40 percent over the same period. Traineeships remained at about the same percentage as in

1970, and "other" support increased slightly. It should be noted, though, that because the number of doctorates planning study has grown significantly since 1970, the actual numbers for all mechanisms increased even when proportions decreased.

Among citizenship groups, U.S. citizens and permanent residents showed the largest proportions having postdoctoral fellowship support (54 percent and 49 percent, respectively), while temporary residents were most likely to hold research associateships (55 percent). This can be explained in part by eligibility requirements, which declare that U.S. government-supported fellowships can be awarded only to U.S. citizens and permanent residents. Therefore, temporary residents must receive their support from other mechanisms, namely research associateships. The distribution among study mechanisms was about the same for the citizenship groups in 1970 and 1978 as in 1988, except that permanent residents received slightly more support from research associateships than from fellowships in the interim years.

TABLE P: Postdoctoral Study Commitments, by Mechanism, Demographic Group, and Broad Field, 1988*

		Fellow-ship	Research Assoc.	Traineeship	Other Study
All Ph.D.s	%	50.5	40.1	3.6	5.9
Men		47.7	43.5	3.2	5.6
Women		56.8	32.1	4.7	6.5
U.S. Citizens		54.2	35.0	3.4	7.4
Permanent Residents		49.0	44.2	3.6	3.2
Temporary Residents		39.1	54.6	4.5	1.8
U.S. Citizens					
American Indians		72.7	18.2	9.1	0.0
Asians		45.8	38.3	5.0	10.8
Blacks		59.4	20.3	2.9	17.4
Hispanics		52.7	37.5	0.9	8.9
Whites		54.3	35.2	3.4	7.1
Physical Sciences		40.8	56.6	1.1	1.5
Engineering		28.5	64.8	4.9	1.8
Life Sciences		59.3	30.5	3.1	7.1
(Agricultural Sciences)**		(35.9)	(59.0)	(2.6)	(2.6)
Social Sciences (incl. Psych.)		60.9	22.9	9.9	6.3
Humanities		63.2	16.0	2.8	18.1
Education		37.8	25.0	11.7	25.5
Professional/Other		39.5	26.3	13.2	21.1

*Percentages are based on responses to postgraduation plans. Only doctorates with definite commitments for study are included.

**Agricultural sciences is disaggregated from the "umbrella" field of life sciences because the distribution of its Ph.D.s among the support mechanisms differs significantly from the distribution in both the biological and health sciences.

Field of doctorate was also related to mechanism of study, although the relationship may have been driven by citizenship status. While five of the broad fields in 1988 received the majority of postdoctoral support through fellowships, research associateships accounted for the largest proportions in physical sciences and engineering (57 percent and 65 percent, respectively). In engineering, the proportion of Ph.D.s receiving research associateships was about 53 percent in both 1970 and 1978 but jumped 12 points over the last decade, to 65 percent, probably because temporary residents were a much larger share of this field in 1988. Also, even though most life science doctorates with study plans in 1988 had fellowships (59 percent), agriculture doctorates were more frequently supported by research associateships (59 percent). Agriculture was another field with a large proportion of temporary residents. Traineeships supported very small percentages of doctorates in the natural sciences, with no field receiving more than 6 percent of its support from this mechanism.

The other broad fields were more diverse in types of study mechanisms reported by doctorate recipients. In 1988, fellowships accounted for more than 60 percent of postdoctoral support in both social sciences and humanities, but significant proportions of Ph.D.s were also supported by research associateships and, in social sciences, by traineeships. Although percentages in these fields resembled those in 1970, numbers for all mechanisms have increased substantially since then. Humanities fellowships showed an especially sharp increase in the last decade, jumping from 53 to 91 in number and from 47 percent to 63 percent in proportion. Traineeships displayed a more erratic pattern in social sciences, tripling in number between 1970 and 1978 (from 24 to 74) and then falling to 57 by 1988. The largest numbers of doctorates in education and professional/other fields in 1988 were also awarded fellowships, but the shares were smaller than in other fields (38 percent in education, 40 percent in professional/other fields). Research associateships and "other" study were reported in almost equal proportion by another 50 percent of Ph.D.s in these two fields, and traineeships supported the remainder.

Sources of Postdoctoral Research Support

The U.S. government was the largest provider of postdoctoral study support among doctorate recipients in 1988, both in proportion (47 percent) and in total numbers (2,390), and it funded greater percentages of all study mechanisms than did any other source (50 percent of fellowships, 47 percent of research associateships, and 37 percent of traineeships). Although the total number of Ph.D.s receiving government support increased from 1,782 in 1970 to 2,390 in 1988, the proportion of Ph.D.s supported by the government declined from 54 percent to 47 percent (down 7 points in fellowships, 5 points in research associateships, 25 points in traineeships, but up 5 points in "other" types of study). Colleges and universities provided the next largest amount of postdoctoral study support (29 percent) and filled the gap resulting from the decline in government funding since 1978, mainly through fellowships and traineeships. The number of doctorates receiving university support rose from 873 to 1,452 over the last decade. Another 12 percent of postdoctoral support in 1988 came from private foundations, which awarded 15 percent of fellowships (and 43 percent of all humanities fellowships). Nonprofit organizations provided only 3 percent of postdoctoral support in 1988, although they funded 12 percent of all traineeships.

As can be seen in Table Q, U.S. citizens and permanent residents in 1988 received their largest shares of postdoctoral study support from the U.S. government, while half of temporary residents relied on colleges and universities. The U.S. government provided funding for 55 percent of U.S. citizens, 43 percent of permanent residents, and 26 percent of temporary residents in 1988; the proportions in 1970 were similar. Nevertheless, the number of non-U.S. citizens receiving U.S. government support continued to grow over

TABLE Q: Postdoctoral Study Commitments, by Primary Source of Research Support, Demographic Group, and Broad Field, 1988*

		U.S. Gov't.	College/ University	Private Foundation	Nonprofit	Other
All Ph.D.s	%	47.4	28.7	11.5	3.1	9.2
U.S. Citizens		54.9	21.4	12.4	2.5	8.8
Permanent Residents		42.7	33.4	8.8	4.1	11.1
Temporary Residents		25.7	50.4	9.3	4.4	10.2
Physical Sciences		47.9	33.6	6.9	2.1	9.4
Engineering		33.0	44.0	9.0	2.5	11.5
Life Sciences		54.5	22.3	13.3	2.8	7.1
Social Sciences		41.9	23.7	16.2	5.8	12.4
Humanities		12.8	42.2	30.3	4.6	10.1
Education		22.5	34.0	13.1	9.0	21.3
Professional/Other		10.0	50.0	16.7	6.7	16.7

*Percentages are based on responses to postgraduation plans. Only doctorates with definite commitments for study are included.

the period, more than doubling for temporary residents in the last 10 years alone. Doctorates in the physical, life, and social sciences in 1988 received most postdoctoral study support from the U.S. government, while those in engineering, humanities, education, and professional/other fields were largely supported by colleges and universities. Private foundations also supported significant percentages of doctorates in most broad fields, with a high of 30 percent in humanities.

Employment Commitments in the United States

Because researchers are primarily interested in the employment situation of doctorates within this country, the discussion of new Ph.D.s' employment commitments is restricted to the United States labor force. The major portion of this section is a detailed analysis of the immediate postgraduation employment plans of U.S. citizens and permanent residents only, since permanent residents are generally the only foreign citizens who can work in the United States without a change in visa status. In recent years, however, temporary residents have not only become an increasingly large proportion of the Ph.D. pool (20 percent in 1988), but more of them have been deciding to work in the United States after graduation (26 percent in 1988). Therefore, this section first summarizes the employment commitments of temporary residents in the United States.

Temporary Residents

In 1988, 26 percent of all temporary residents reporting postgraduation commitments (925 Ph.D.s) planned to be employed in the United States, at least temporarily. U.S. academe and industry were the major employers of these new Ph.D.s, employing 67 percent and 28 percent, respectively. Research and development (R&D) and teaching were the primary work activities, engaging 53 percent and 39 percent of Ph.D.s, respectively. Most temporary residents working in academe planned to teach (332 Ph.D.s, or 58 percent), while the vast majority in industry planned to conduct R&D (197, or 81 percent).

Engineering doctorates comprised the largest group of temporary residents working in the United States upon graduation in 1988 (346 Ph.D.s, or 37 percent), followed by physical sciences (186, or 20 percent), social sciences (148, or 16 percent), professional/other fields (117, or 13 percent), humanities (82, or 9 percent), life sciences (32, or 3 percent), and education (14, or 2 percent). All fields except engineering showed large majorities of temporary residents with employment commitments in academe, ranging from 66 percent in physical sciences to 95 percent in humanities. In engineering, however, 53 percent planned to work in industry versus 45 percent in academe. A significant share of physical science doctorates also reported commitments in industry (32 percent). R&D was the primary work activity of over four-fifths of the industrially-employed in both engineering and the physical sciences. Within academe, all fields showed majorities engaged primarily in teaching, except life sciences and professional/other fields, where R&D engaged slightly higher percentages.

An examination of trend data reveals a dramatic increase over the past 20 years in the number of temporary residents electing to work in the United States immediately upon receipt of the doctorate: between 1968 and 1988, this number more than doubled, rising from 460 to 925 (however, because of the movement toward further study, the proportion dropped from 28 percent to 26 percent). While physical sciences, engineering, social sciences, and humanities all experienced similar increases, the number of doctorates in professional/other fields soared from 14 in 1968 to 117 in 1988, a greater than eightfold increase; 87 percent of these individuals earned doctorates in business fields. Only life sciences and education showed declines, and their numbers were small throughout the period.

The academic and industrial sectors displayed a similar pattern of growth, with numbers of temporary residents climbing in U.S. academe from 295 in 1968 (64 percent of those employed in the United States) to 622 in 1988 (67 percent) and in industry from 127 to 261 (28 percent in both years). Professional/other fields experienced an even greater increase in academe (from 9 to 109 Ph.D.s) than in the overall labor force. Although teaching engaged a smaller proportion of academically-employed temporary residents in 1988 than in 1968 (58 percent versus 64 percent), the actual number of new Ph.D.s planning primarily to teach rose by almost 80 percent, from 185 in 1968 to 332 in 1988. Only in life sciences and education (the two fields experiencing decreases in U.S.-employed temporary residents) did the number of Ph.D.s with teaching plans drop. Within industry, R&D also showed a proportionate decline (from 91 percent of temporary resident Ph.D.s in 1968 to 81 percent in 1988); but again, numbers increased from 114 to 197 over the period.

Although the above discussion focuses on the most recent 20-year period, it must be pointed out that almost all gains in U.S. employment of temporary residents occurred during the last decade, the period when total numbers of temporary residents earning doctorates in this country burgeoned. Between 1968 and 1978, the number of U.S.-employed temporary residents actually declined somewhat, from 460 to 427 new Ph.D.s. Professional/other fields was the only field to show significant growth during that decade; all other fields expanded only over the last 10 years.

Employment Sector (U.S. Citizens and Permanent Residents)

The remainder of the section on employment plans of new Ph.D.s focuses only on U.S. citizens and permanent residents, since they are most likely to be long-term participants in the U.S. labor force. In 1988, 50 percent of those planning to work in the United States after graduation found employment in academe, 20 percent in industry, 11 percent in government, and 19 percent in "other" sectors (which include nonprofit organizations and elementary/secondary schools). As can be seen in Table R, academe employed the largest proportions of new Ph.D.s in all broad fields except physical sciences and engineering; in these two fields, industry employed 50 percent or more of Ph.D.s in 1988. Humanities doctorates were the most likely to work in academe (79 percent), while engineering doctorates were the least likely (29 percent).

Nonetheless, academe has declined as an employer over the past 20 years (Table R and Figure 10). Although half of new U.S. citizen and permanent resident Ph.D.s staying in the United States in 1988 reported that they planned to work in academe (6,580 out of 13,223 total), employment commitments in this sector have declined since 1968, when 67 percent of new Ph.D.s were so employed. The academic sector was relatively stable until 1973, after which doctorate production began to fall and smaller proportions of the pool found employment in academe: the percentage of new Ph.D.s entering the academic sector decreased about 10 points from 1968 to 1978 and another 7 points in the last decade; the number also dropped, from 9,858 in 1968 to 6,580 in 1988. While 4-year colleges and universities showed a significant decline over the period, medical colleges maintained their proportionate level--at least since 1978, when they were first separated from other institutions on the survey questionnaire. Junior colleges reached their peak as an employer in 1976 but have continued to decline since then.

Between 1968 and 1978, the downward trend in academe was balanced by about 5-point increases in the percentages of new Ph.D.s employed in both government and "other" (mainly elementary/secondary schools and nonprofit organizations). In 1978, however, government began declining proportionately as an employer. This decline was evenly distributed among federal, state, and local governments, although more than half of those working in government in 1988 were federal employees. At the same time, industry started employing larger numbers of doctorates, increasing its share from 15 percent in 1978 to 20 percent in 1988. Within this sector, self-employment nearly doubled during the same period. "Other" sectors also increased over the last decade, with elementary/secondary schools and nonprofit organizations experiencing marked growth. In fact, these employers have nearly doubled both their numbers and proportions of new doctorates since 1968.

Table R shows that while all broad fields shared in academe's 20-year decline, percentages in social sciences and education dropped the most precipitously. The proportion of new social science doctorates employed in academe decreased 30 points over the period (from 75 percent to 45 percent), and the proportion for education dropped 24 points (from 68 percent to 44 percent). All other employment sectors showed increases in these fields. Humanities' decrease of 15 percentage points in academe was balanced by increases in government and "other," while industry accommodated the 14-point dropoff in the physical and life sciences. Engineering and professional/other fields have declined the least in academe since 1968, falling 4 and 7 percentage points, respectively.

Further disaggregation of the data by demographic group reveals a consistent pattern of diminishing proportions of new Ph.D.s employed in academe. The percentage of men with commitments in the academic sector decreased from 65 percent in 1968 to 46 percent in 1988; the percentage of women fell from 80 percent to 55 percent over the same period. Nevertheless, between 1968 and 1988, women still increased their participation in academe, both in numbers employed (from 1,352 to 2,929) and as a proportion of the sector (from 14 percent to 45 percent). Men, on the other hand, decreased their

TABLE R: Employment Sector of Doctorate Recipients with Employment Commitments in the United States, by Major Field, 1968, 1978, and 1988 (U.S. Citizens and Permanent Residents)*

Field of Doctorate		Employment Sector											
		Academe			Industry			Government			Other		
		1968	1978	1988	1968	1978	1988	1968	1978	1988	1968	1978	1988
Total All Fields		9,858	8,189	6,580	2,184	2,216	2,701	1,092	1,815	1,422	1,661	2,311	2,520
	%	66.6	56.4	49.8	14.8	15.3	20.4	7.4	12.5	10.8	11.2	15.9	19.1
Physical Sciences		1,323	596	523	913	711	723	247	227	171	157	38	28
	%	50.1	37.9	36.2	34.6	45.2	50.0	0.0	14.4	11.8	0.0	2.4	1.9
Physics/Astronomy		52.1	25.9	26.1	25.0	46.9	48.2	16.1	24.1	23.4	6.7	3.1	2.3
Chemistry		29.5	18.4	15.3	58.9	71.4	77.7	4.9	7.7	5.0	6.7	2.5	2.0
Earth, Atmos., Marine		50.7	33.2	39.3	25.9	36.1	30.4	17.8	27.9	29.5	5.6	2.9	0.9
Mathematics		79.9	70.8	75.9	12.6	19.1	19.0	3.7	8.2	2.3	3.9	1.9	2.8
Computer Sciences		NA	58.2	56.6	NA	35.8	32.7	NA	6.0	8.8	NA	0.0	1.8
Engineering		621	252	360	876	613	702	198	188	190	169	21	12
	%	33.3	23.5	28.5	47.0	57.1	55.5	10.6	17.5	15.0	9.1	2.0	0.9
Life Sciences		1,059	800	650	189	277	297	225	221	211	135	58	95
	%	65.9	59.0	51.9	11.8	20.4	23.7	14.0	16.3	16.8	8.4	4.3	7.6
Biological Sciences		68.0	60.9	47.7	9.0	17.7	27.1	13.0	16.4	18.0	9.9	5.0	7.2
Health Sciences		56.8	62.9	63.1	23.7	17.2	13.8	6.8	14.5	12.5	12.7	5.5	10.6
Agricultural Sciences		62.2	53.7	44.3	16.1	26.7	30.8	19.3	17.3	20.4	2.4	2.4	4.4
Soc. Sci. (incl. Psych.)		1,784	1,741	1,178	114	286	506	251	475	372	219	475	556
	%	75.3	58.5	45.1	4.8	9.6	19.4	10.6	16.0	14.2	9.2	16.0	21.3
Psychology		61.0	40.0	29.6	6.5	12.4	24.6	17.0	20.7	16.5	15.6	26.9	29.3
Other Social Sciences		85.1	76.2	66.2	3.7	6.9	12.3	6.3	11.4	11.1	4.9	5.5	10.4
Humanities		2,568	1,688	1,336	16	100	98	32	78	62	118	178	189
	%	93.9	82.6	79.3	6.0	4.9	5.8	1.4	3.8	3.7	4.3	8.7	11.2
Education		2,104	2,263	1,651	32	149	277	120	544	340	832	1,406	1,501
	%	68.1	51.9	43.8	1.0	3.4	7.3	3.9	12.5	9.0	26.9	32.2	39.8
Professional/Other		399	849	882	44	80	98	19	82	76	31	135	139
	%	80.9	74.1	73.8	8.9	7.0	8.2	3.9	7.2	6.4	6.3	11.8	11.6
Business & Management		84.6	87.0	90.0	9.1	7.9	7.0	1.9	4.3	2.6	4.4	0.8	0.4
Communications		88.9	83.9	81.9	8.3	9.3	8.1	0.0	4.1	2.0	2.8	2.6	8.1

*Percentages are based on responses to postgraduation plans. Only doctorates with definite commitments for employment are included. Foreign locations are excluded.

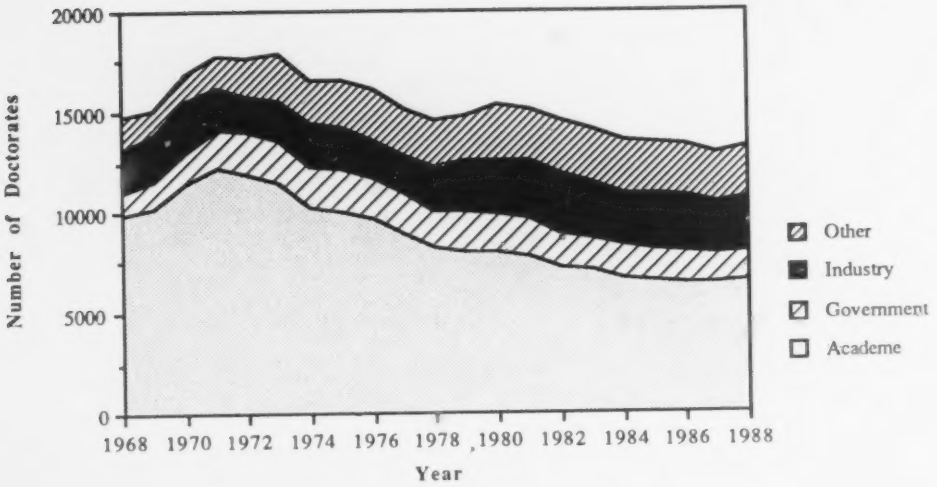


Figure 10. Employment sector in the U.S. labor force, 1968 to 1988 (U.S. citizens and permanent residents).

participation in academe over the 20-year period, from 8,506 (or 86 percent) to 3,651 (or 55 percent). A look at the movement into other sectors shows that although the proportions of both male and female doctorates planning to work in industry have grown since 1968 , men still comprised 73 percent of all new Ph.D.s in this sector in 1988. The actual number of men employed in industry, however, dropped from 2,138 in 1968 to 1,980 in 1988, while the number of women increased dramatically from 46 in 1968 to 721 in 1988.

Because data for race/ethnicity are not available before 1975, 1978 data are used for comparisons of racial/ethnic groups. In 1988, the majority of U.S.-citizen black and Hispanic Ph.D.s reported employment commitments in academe (56 percent and 51 percent, respectively), while the greatest number of U.S. Asians reported commitments in industry (43 percent). (American Indians were too few in number to be analyzed.) Although the proportions of U.S. blacks and Hispanics employed in the academic sector were still large in 1988, they showed a decline since 10 years ago, when the respective proportions were 64 percent and 63 percent. In contrast, the proportion of U.S. Asians who planned to work in industry increased, from 36 percent in 1978 to 43 percent in 1988.

Readers may be interested in the distribution of racial/ethnic groups in the academic sector. In 1988, 5,664 new U.S. white Ph.D.s were employed in academe (or 91.3 percent of the sector). U.S. blacks were the next largest group (281 Ph.D.s, or 4.5 percent of the sector), followed by U.S. Hispanics (155, or 2.5 percent) and U.S. Asians (87, or 1.4 percent). However, U.S. blacks showed a decline since 1978, when they made up 5.1 percent of all new Ph.D.s employed in academe, while whites maintained the same proportion, and U.S. Asians and Hispanics increased their respective shares from 1.0 and 2.3 percent. Nevertheless, as the total number of new doctorates in academe declined over the last decade, so did the numbers for the racial/ethnic groups; only U.S. Asians showed a small increase, from 76 academically-employed Ph.D.s in 1978 to 87 in 1988.

Work Activity (U.S. Citizens and Permanent Residents)

Table S displays the primary work activities of new doctorates with employment commitments in the United States, by employment sector and doctorate field. The largest proportion of U.S. citizens and permanent residents continued to indicate teaching as their primary work activity (37 percent), followed by R&D (28 percent), administration (16 percent), professional services (16 percent), and other (4 percent). However, since 1968, teaching's share of new doctorates has fallen 18 percentage points and its numbers have decreased from 7,998 to 4,708. R&D's share has declined slightly as well (2 percentage points), with its numbers dropping from 4,350 to 3,474. Administration and professional services, on the other hand, have gained 7 and 11 percentage points, respectively, in their proportionate shares. Moreover, the number of Ph.D.s working in administration has increased during the period from 1,301 to 2,017 and in professional services from 686 to 1,984.

Disaggregation of the data for 1968 and 1988 by sector reveals that, in academe, teaching has declined as a primary work activity (from 80 percent to 66 percent), but R&D has increased (from 12 percent to 18 percent). In fact, academe was the only sector to experience proportionate growth in R&D over the 20-year period, and the number of Ph.D.s in R&D in 1988 was only slightly less than in 1968. In industry, meanwhile, R&D activity fell from 89 percent of doctorates (1,926) in 1968 to 60 percent (1,537) in 1988. At the same time, the percentage of Ph.D.s performing professional services in the industrial sector rose 21 points (from 5 percent in 1968 to 26 percent in 1988), and the corresponding number increased 6.5 times (from 103 to 666). This increase was in large part attributable to the growing pool of self-employed individuals, especially in social work and in clinical, counseling, and educational psychology. In both 1968 and 1988, doctorates who obtained jobs in government were most inclined to work in R&D, followed in almost equal proportions by administration and professional services. However, over this period, the percentage of Ph.D.s in R&D decreased from 70 percent to 44 percent, while the percentages in the other activities almost doubled. Doctorates employed in "other" sectors (mainly elementary/secondary schools and nonprofit organizations) also showed their largest shares in administration and professional services.

R&D was the most frequently reported activity in physical sciences and engineering in 1988, as it was 20 years ago; in fact, R&D has grown in these fields since 1968. The largest proportion of life science doctorates also planned R&D as their primary work activity (around 50 percent throughout the past two decades), but teaching employed a significant share as well (41 percent in 1968; 29 percent in 1988). In 1988, doctorates in education leaned slightly more toward administration than teaching (42 percent versus 37 percent), and those in social sciences were most inclined to perform professional services (40 percent). Twenty years ago, these two fields showed teaching with the largest proportions (51 percent in education; 61 percent in social sciences). Teaching, however, remained the primary work activity for doctorates in humanities and professional/other fields (75 percent and 55 percent, respectively).

The data were further disaggregated by type of graduate school support to explore the possibility of a correlation between postdoctoral research activity and source and mechanism of predoctoral support. It was found that while the fields of physical sciences, engineering, and life sciences exhibited high levels of research activity regardless of the type of graduate school support, the research activity level in the other broad fields did appear to be related to the source and mechanism of support. In social sciences, humanities, education, and professional/other fields, research activity was greater among Ph.D.s primarily supported in graduate school by the federal government or the university, and through traditional mechanisms such as RAs and TAs, fellowships, and traineeships. Because federal support was minimal in these fields, the vast majority of researchers received their primary predoctoral support from the university (see Table T).

TABLE S: Primary Work Activity of Doctorate Recipients with Employment Commitments in the United States, by Sector and Broad Field, 1968, 1978, and 1988 (U.S. citizens and permanent residents)*

	Primary Work Activity														
	R&D			Teaching			Administration			Prof. Services			Other		
	1968	1978	1988	1968	1978	1988	1968	1978	1988	1968	1978	1988	1968	1978	1988
All Ph.D.s %	29.8	23.4	27.5	54.7	46.4	37.3	8.9	15.3	16.0	4.7	11.9	15.7	1.9	3.0	3.6
Academe	12.1	11.9	18.3	79.8	75.0	66.3	5.3	8.8	9.6	2.2	3.6	4.6	0.6	0.7	1.3
Industry/Self Empl.	89.1	67.2	59.7	0.2	1.2	2.0	2.5	5.2	5.0	4.8	18.0	25.9	3.4	8.4	7.4
Government	70.3	41.7	43.5	1.8	3.4	3.8	10.9	26.0	23.9	13.4	23.6	22.4	3.7	5.3	6.5
Other	30.4	9.9	8.5	9.5	19.6	18.0	39.1	39.5	40.0	14.6	26.9	29.7	6.4	4.1	3.8
Physical Sciences	57.8	61.5	69.0	38.2	29.0	22.0	1.1	2.4	2.0	1.1	4.2	4.5	1.8	2.9	2.5
Engineering	66.2	70.6	73.2	28.0	17.4	16.9	2.4	3.2	2.6	1.2	5.0	4.9	2.2	3.7	2.6
Life Sciences	51.1	47.7	46.4	40.9	34.8	28.6	2.4	3.8	7.5	2.6	9.7	12.9	2.9	4.0	4.5
Social Sciences	19.6	19.3	21.1	60.6	46.8	28.8	4.1	5.7	6.9	13.0	26.3	39.5	2.6	2.0	3.7
Humanities	2.1	4.2	6.3	92.6	79.7	74.7	2.9	7.3	6.1	1.4	4.8	6.9	1.0	4.1	6.0
Education	8.5	6.1	5.6	51.0	42.1	36.6	31.7	38.1	41.8	7.5	11.7	13.2	1.2	2.1	2.8
Professional/Other	10.0	8.5	20.9	73.2	67.0	54.8	8.9	11.9	9.7	4.7	7.9	10.7	3.3	4.7	3.9

*Percentages are based on responses to postgraduation plans. Only doctorates with definite commitments for employment are included. Foreign locations are excluded.

As Table T shows, 54 percent of Ph.D.s with employment commitments in 1988 planned research as a primary or secondary work activity. These doctorates were distributed among the sectors as follows: 31 percent (3,860) in academe, 14 percent (1,749) in industry, 6 percent (732) in government, and 4 percent (460) in "other". More than half of this group (28 percent of the employment pool) indicated research as their

TABLE T: Research Activity of Doctorate Recipients with Employment Commitments in the United States, by Primary Source of Graduate Support, 1988 (U.S. citizens and permanent residents)*

Primary Source of Graduate Support	Number of Ph.D.s	Percent with Research as Primary or Secondary Activity	Percent with Research as Primary Activity
Total All Sources**	12,562	54.1	28.0
Federal Total***	915	75.6	55.3
RA (NSF, NIH, USDA, Other)	390	90.3	71.8
Fellowship (NSF, USDA)	63	90.5	68.3
Traineeship (NIH)	96	72.9	49.0
Other HHS	27	66.7	37.0
G*POP (noncompetitive fellowship)	22	72.7	36.4
Other Department of Education	47	55.3	17.0
GI Bill	71	18.3	12.7
Other Federal	199	70.4	50.8
University Total***	3,603	73.5	40.4
Teaching Assistant	1,686	72.0	29.1
Research Assistant	1,211	84.6	63.9
Fellowship	1,470	66.4	31.1
College Work-Study	26	53.8	23.1
Other University	210	40.0	18.1
Personal	6,463	39.5	15.8
Own/Family Contributions	5,806	39.4	15.9
Loans	657	40.1	14.3
Other Sources	642	58.4	39.7
National Fellowship	112	78.6	49.1
Business/Employer	442	54.5	39.8
Other	88	52.3	27.3

*Includes only Ph.D.s who reported definite commitments for employment and work activity plans. Excludes Ph.D.s planning to work in foreign locations.
**Includes Ph.D.s whose primary source of support is unknown.
***Federal agencies also fund students indirectly through universities. Those students generally fall under "University" in this table.

primary work activity. Across all fields, primary predoctoral support from the federal government or the university appeared to be related to prevalence of postdoctoral research activity: among new Ph.D.s with employment commitments, 76 percent of the federally-supported and 74 percent of the university-supported planned to do research in 1988, compared to 40 percent supported by personal sources and 58 percent supported by "other" sources. Government support also resulted in a higher percentage of primary research activity than did any of the other sources (55 percent versus 40 percent for university and "other" and 16 percent for personal).

Recipients of predoctoral fellowships and RAs funded by large federal agencies showed the largest proportions going into research in 1988 (about 90 percent), followed by university RAs (85 percent) and competitive fellowships supported by foundations such as Ford and Rockefeller (79 percent). It should be noted, however, that while federal government support exhibited the highest proportionate levels of postdoctoral research activity, university-supported researchers outnumbered the federally-supported by almost 4:1 (2,648 Ph.D.s versus 692 Ph.D.s). Moreover, among doctorates reporting research as their primary work activity, there were almost three times as many with predoctoral university support as federal support (1,455 Ph.D.s versus 506 Ph.D.s). More than 85 percent of researchers whose primary graduate school support came from the university had been teaching or research assistants.

Field-Switching (U.S. Citizens and Permanent Residents)

Researchers have long been concerned with demand in the U.S. labor market for Ph.D.s in certain fields and the adaptability of Ph.D.s in markets that are saturated. To shed light on the current situation, field of employment of the most recent doctoral cohort was compared with field of doctorate. Two measures were computed: (1) percentage of doctorates with fine field of employment the same as fine field of doctorate and (2) percentage of doctorates with the two fine fields different but within the same major field. The seven broad fields were disaggregated into major field categories for the second measure. (See the survey specialties list at the back of this report for major field groupings. Each subheading on the list was considered a major field, except that physics and astronomy were combined and all education groupings counted as one major field. Recipients who indicated "general" or "other" fields were not included.)

The data show that in 1988, 68 percent of new doctorate recipients with employment commitments in the United States planned to work in their fine field of doctorate, and 85 percent planned to work in the same major field. When the data were disaggregated by sector, however, it was found that percentages for same-field employment were generally higher in academe than in nonacademe (see Table U); this means that there was less field-switching in academe than in other sectors. Overall, 72 percent of Ph.D.s in academe were employed in their fine field of doctorate, compared to 64 percent of Ph.D.s in nonacademe. The percentages for major-field employment were less discrepant at 86 percent and 83 percent, respectively. Both sector groups showed similar percentages in computer/information sciences and in psychology. However, percentages for the two groups differed significantly in the other physical and social science fields, as well as in humanities and professional fields, although differences for the major field measure were more moderate. Education and psychology were the only fields exhibiting higher levels of same-field employment in nonacademe than in academe--partly because large numbers of doctorate recipients in these fields planned to be self-employed. More than 54 percent of education doctorates in nonacademic sectors were employed in their fine field of doctorate versus 45 percent in academe; and 83 percent in nonacademe were employed in their major field of doctorate versus 73 percent in academe. In psychology, fine-field employment was slightly higher in the academic sector, but major-field employment was higher in nonacademic sectors (92 percent versus 85 percent).

TABLE U: Field-Switching of Doctorate Recipients with Employment Commitments in the United States, by Sector, 1988 (U.S. citizens and permanent residents)*

Field of Doctorate**	Academe		Nonacademe	
	Percent Employed in Same Fine Field	Percent Employed in Same Major Field	Percent Employed in Same Fine Field	Percent Employed in Same Major Field
All Fields	71.9	86.2	64.0	83.4
Physical Sciences	84.1	91.9	65.7	83.8
Physics/Astronomy	83.3	87.5	60.3	75.6
Chemistry	91.3	97.5	65.6	90.4
Atmos. & Meteor. Sci.	75.0	100.0	57.1	85.7
Geological Sciences	73.8	100.0	62.0	78.0
Mathematics	87.1	89.4	40.5	45.9
Computer & Information Sci.	87.9	90.1	86.8	88.2
Engineering	77.8	92.7	71.9	91.4
Life Sciences	79.5	91.3	72.0	85.3
Biological Sciences	71.3	86.8	66.7	85.4
Health Sciences	88.0	94.8	84.3	88.8
Agricultural Sciences	74.0	90.4	70.5	82.8
Social Sciences	80.6	86.7	70.4	85.7
Psychology	76.0	84.7	74.6	91.7
Other Social Sciences	83.0	87.7	57.2	66.7
Humanities	80.7	89.9	58.2	60.9
History	78.3	89.2	47.4	50.0
Letters	70.0	86.9	31.7	36.6
Foreign Languages	95.0	96.0	31.3	37.5
Professional Fields	77.7	91.9	61.3	70.4
Business Administration	80.7	95.7	51.6	71.0
Communications	59.2	87.8	30.0	35.0
Education	44.5	73.1	54.1	82.7

*Percentages are based on responses to postgraduation plans. Only doctorates with definite commitments for employment are included. Doctorates who reported "general" or "other" fields are excluded. Foreign locations are also excluded.

**Although only "umbrella" fields are listed, percentages represent employment in fine field or major field of doctorate, as indicated in column headings. The data should be interpreted as follows: looking at the major field of mathematics in academe, the first column shows that 87.1 percent of Ph.D.s who reported a fine field of doctorate in mathematics (i.e. algebra) found employment in that same fine field. The second column shows that 89.4 percent of mathematics Ph.D.s found employment within mathematics, but not necessarily in their fine field of doctorate. For example, a Ph.D. in algebra who planned to work in geometry is considered to be in his/her field in the second column, but not in the first. A Ph.D. in algebra who found a job in algebra is considered to be in his/her field in both columns. These individuals count in the same columns for the broad field of physical sciences.

Within academe in 1988, the lowest percentages of employment in fine field of doctorate (and, therefore, the greatest field-switching) were found in education (45 percent) and communications (59 percent), although the percentages for the major field were much higher. The highest percentages for fine-field employment were in foreign languages and literature (95 percent) and chemistry (91 percent). The smallest proportions of doctorates staying in the same major field were in education (73 percent) and psychology (85 percent); the largest were in atmospheric and meteorological sciences, geological sciences, chemistry, foreign languages, and business administration (all over 95 percent). It should be noted that although some areas displayed a fair amount of field-switching between fine fields, much less was evident outside the major field.

Among Ph.D.s with employment commitments in nonacademic sectors in 1988, the lowest percentages of employment for both the fine field and major field measures (and, therefore, the greatest field-switching) were in mathematics, communications, and the humanities fields, at 50 percent or less. The highest percentages (and the least field-switching) for fine-field employment were in computer/information sciences (87 percent) and health sciences (84 percent). For major-field employment, the highest percentages were in psychology (92 percent), engineering (91 percent), and chemistry (90 percent).

To gain a perspective over time, the same measures were computed for the year 1970 (employment field did not appear on the survey form until 1969). The data reveal that field-switching has increased since that time. While 78 percent of doctorates in all sectors combined found employment in their fine field of doctorate in 1970, only 68 percent did so in 1988; and the percentage with jobs in the major field of doctorate decreased from 90 percent to 85 percent. Academe exhibited similar changes, with fine-field employment dropping from 82 percent in 1970 to 72 percent in 1988, and major-field employment from 92 percent to 86 percent. Within nonacademic sectors, employment in the fine field of doctorate fell from 72 percent in 1970 to 64 percent in 1988, and employment in the same major field fell from 87 percent to 83 percent.

Summary

The immediate postgraduation commitments of new doctorate recipients were examined for the 20-year period, 1968 to 1988. During this period, the proportion of Ph.D.s with study plans increased steadily from 13 percent to 26 percent, while the proportion with employment plans decreased commensurately from 87 percent to 74 percent. The movement toward continued study was evidenced in all broad fields but was most pronounced in the physical and life sciences. Over the last 20 years, there was also an increase in both the number of non-U.S. citizens earning doctorates in the United States and the number remaining in this country after graduation, especially among temporary residents.

Although postdoctoral fellowships were held by half of new Ph.D.s with study commitments in 1988, the proportion of Ph.D.s supported by this mechanism declined over the past two decades. The proportion of research associateships, on the other hand, increased (probably because of the influx of temporary residents and government regulations restricting fellowship support to U.S. citizens and permanent residents). These associateships accounted for most study support in physical sciences and engineering, both fields in which non-U.S. citizens were concentrated. The U.S. government was the largest provider of postdoctoral study support in 1988 (mostly in the physical, life, and social sciences), followed by colleges and universities.

The major portion of the discussion on employment plans focused on U.S. citizens and permanent residents with commitments in the United States (although temporary residents staying in this country to work were also discussed briefly). In 1988, academe still employed 50 percent of new doctorates in the U.S. labor force. However, while other

sectors--especially industry--have grown as employers of Ph.D.s since 1968, academe has declined significantly. This decline was shared by all demographic groups and all broad fields but was especially severe in social sciences and education.

Teaching remained the most frequently reported primary work activity of employed Ph.D.s in 1988 (37 percent), but together with academe, teaching has experienced a dramatic decline since 1968, both in numbers employed and as a proportion of the cohort. R&D has also decreased, though only slightly. Administration and professional services, on the other hand, have grown as primary work activities over the last two decades.

Field-switching among new Ph.D.s in the U.S. labor force was investigated by comparing employment field with doctorate field. In 1988, 68 percent of U.S. citizens and permanent residents planned to work in the same fine field as their doctorate, and 85 percent planned to work in the same major field. In general, the academic sector experienced less field-switching than did nonacademic sectors. Trend data show an increase in field-switching since 1970.

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APPENDIX A: The Six Basic Tables

Table titles and headings are generally self-explanatory, but a few terms need special definition or explanation. The survey questionnaire is presented at the back of the report.

Table 1	Number of Doctorate Recipients, by Sex and Subfield, 1988
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Table 2	Statistical Profile of Doctorate Recipients, by Field of Doctorate, 1988
Table 3	Sources of Support in Graduate School of Doctorate Recipients, by Sex and Summary Field, 1988
Table 4	State of Doctoral Institution of Doctorate Recipients, by Sex and Summary Field, 1988
Table 5	Statistical Profile of Doctorate Recipients, by Racial/Ethnic Group and Citizenship Status, 1988
Table 6	Institutions Granting Doctorates, by Summary Field, 1988

Tables 1 and 1A: These tables display data for the most recent year by subfield of doctorate. The subfields correspond to the fields on the questionnaire's Specialties List located at the back of this report. Field groupings may differ from those in reports published by federal sponsors of the Survey of Earned Doctorates (SED). See inside the back cover for a description of field groupings as reported in these tables. The "general" field categories--e.g., "chemistry, general"--contain individuals who either received the doctorate in the general subject area or did not indicate a particular specialty field. The "other" field categories--e.g., "chemistry, other"--include individuals whose specified doctoral discipline was not included among the specialty fields.

Table 1 presents data by doctoral specialty and sex. Table 1A displays doctoral specialty by citizenship and racial/ethnic group. See the explanatory note on Table 5 for further description of the race/ethnicity variable and changes that have been made to the question over the years.

Table 2: There are three 2-page tables: one contains data about all doctorate recipients in the most recent year, and the other two present data by sex. Field groupings may differ from those in reports published by federal sponsors of the SED. See inside the back cover for a description of field groupings as reported in these tables; see the questionnaire's Specialties List at the back of the report for the names and codes of the subfields included. Terms requiring definition are as follows:

- *Median Age at Doctorate*: One-half received the doctorate at or before this age.
- *Percentage with Master's*: The percentage of doctorate recipients in a field who received a master's degree in any field before earning the doctorate.
- *Median Time Lapse*: "Total Time" refers to total calendar time elapsed between the year of baccalaureate and the year of doctorate; "Registered Time" refers to the total time registered in a university between baccalaureate and doctorate.

Each year's doctorate recipients provide information on postgraduation employment or study plans in response to items 21 and 22 on the survey form. Since the questionnaire is filled out at about the time the doctorate is received, these planned activities can be subject to change. However, comparisons with data from the longitudinal Survey of Doctorate Recipients have shown these data to be a reasonable predictor of actual employment status

in the year following the doctorate.[7] Postgraduation plans of the doctorate recipients are grouped as follows: "Postdoctoral Study Plans" (fellowship, research associateship, traineeship, other), "Planned Employment" (educational institution, industry, etc.), or "Postdoctoral Status Unknown." The sum of these lines totals 100 percent for each column, with allowance for rounding: for example, 52.6 percent of all chemists had postdoctoral study plans, 39.3 percent planned to be employed, and 8.1 percent did not report their postgraduation plans; these total 100.0 percent. The study and employment rows are further subdivided--showing that 24.3 percent of all the chemists planned to pursue postdoctoral fellowships; 26.9 percent, research associateships; 0.6 percent, traineeships; and 0.8 percent, some other form of postdoctoral study. The employment row is similarly subdivided; the percentages, listed by type of employer, show that a total of 39.3 percent planned employment.

The four lines of data beginning with "Definite Postdoctoral Study" distinguish between individuals who have definite postgraduation plans (item 21: "Am returning to, or continuing in, predoctoral employment" or "Have signed contract or made definite commitment") and those who are still seeking employment or postdoctoral study (item 21: "Am negotiating with one or more specific organizations," "Am seeking position but have no specific prospects," or "Other"). These four lines, when added to the prior line, "Postdoctoral Status Unknown," total 100 percent with allowance for rounding. The two lines, "Definite Postdoctoral Study" and "Seeking Postdoctoral Study," add to give the percentage having "Postdoctoral Study Plans"; the two lines, "Definite Employment" and "Seeking Employment," add to give the percentage having "Planned Employment After Doctorate."

Percentages showing the distribution of doctorate recipients by work activity and by region of employment are based on those who have definite employment commitments. They exclude those still seeking employment and those planning postdoctoral study as described above.

Table 3: Table 3 displays data reported from item 18 on all sources of financial support received during graduate school, by sex and summary field. Field groupings may differ from those in reports published by federal sponsors of the SED. See inside the back cover for a description of field groupings as reported in this table; see the questionnaire's Specialties List at the back of the report for the names and codes of the subfields included.

Doctorate recipients indicate multiple sources of support. In this table, a recipient counts once in each source category from which he or she received support. The data should be interpreted as follows: 782 male doctorate recipients in the physical sciences reported financial support from National Science Foundation research assistantships during graduate school. This number is 19.3 percent of the male physical sciences doctorates who answered the question, and it is 52.9 percent of the males in all fields who reported NSF research assistantship support. Since students indicate multiple sources of support, the vertical percentages sum to more than 100 percent.

Table 4: This table shows, by sex and summary field, the number of persons receiving a doctorate in the most recent year from institutions in each of the 50 states, the District of Columbia, and Puerto Rico. Field groupings may differ from those in reports published by federal sponsors of the SED. See inside the back cover for a description of field groupings as reported in this table; see the questionnaire's Specialties List at the back of the report for the names and codes of the subfields included.

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[7] See the discussion on page 22 of *Summary Report 1982* and also Lindsey R. Harmon, *A Century of Doctorates: Data Analyses of Growth and Change*, Washington, D.C.: National Academy of Sciences, 1978, pp. 92-93.

Table 5: Table 5 contains data by racial/ethnic group (first included in *Summary Report 1973*) and by citizenship status for selected variables from Tables 2 and 3. Field groupings displayed may differ from those in reports published by federal sponsors of the SED. See inside the back cover for a description of field groupings as reported in these tables; see the questionnaire's Specialties List at the back of the report for the names and codes of the subfields included.

In 1977 the item on racial/ethnic group in the survey questionnaire was revised to coincide with the question format recommended by the Federal Interagency Committee on Education and adopted by the Office of Management and Budget (OMB) for use in federally sponsored surveys; an explanation of the effect of these changes is detailed on page 13 of *Summary Report 1977*. Changes in the OMB guidelines prompted the moving of persons having origins in the Indian subcontinent from the white category to Asian in 1978. In 1980, two survey revisions were made: (1) the category Hispanic was subdivided into Puerto Rican, Mexican American, and "other" Hispanic to provide more detail for users of the racial/ethnic data, and (2) respondents were asked to check only one racial category (prior to 1980, doctorate recipients could check more than one category to indicate their race). However, when the data were compiled, all persons who checked Asian, American Indian, or Hispanic and also checked white were included in the minority-group category; and those whose responses were black as well as any other category were designated as black.

Beginning with the 1982 survey, this item was revised to separate questions on racial and ethnic groups. Respondents are first asked to check one of the four racial group categories (American Indian, Asian, black, or white) and then to indicate Hispanic heritage. For purposes of analysis, all respondents who indicated Hispanic heritage, regardless of racial identification, are included in one of three Hispanic groups. The remaining survey respondents are then counted in the respective racial groups.

Table 6: This table displays data by doctorate-granting institution and summary field. It includes all institutions in the 50 states, the District of Columbia, and Puerto Rico that awarded doctoral degrees in the most recent year. Field groupings may differ from those in reports published by federal sponsors of the SED. See inside the back cover for a description of field groupings as reported in this table; see the questionnaire's Specialties List at the back of the report for the names and codes of the subfields included.

APPENDIX A, TABLE 1 Number of Doctorate Recipients, by Sex and Subfield, 1988 [1/]

Subfield of Doctorate	Number of Doctorates		
	Men	Women	Total
TOTAL ALL FIELDS	21666	11790	33456
PHYSICAL SCIENCES	4429	880	5309
MATHEMATICS	628	121	749
Applied Mathematics	125	17	142
Algebra	44	10	54
Analysis and Functional Analysis	61	15	76
Geometry	40	4	44
Logic	17	2	19
Number Theory	21	5	26
Probability and Math Statistics	121	31	152
Topology	24	3	27
Computing Theory and Practice	9	3	12
Operations Research	26	3	29
Mathematics, General	115	20	135
Mathematics, Other	25	8	33
COMPUTER SCIENCE	458	56	514
Computer Sciences	403	39	442
Information Sciences and Systems	55	17	72
PHYSICS AND ASTRONOMY	1172	130	1302
Astronomy	53	13	66
Astrophysics	61	3	64
Acoustics	14	2	16
Atomic and Molecular	69	8	77
Electron	2		2
Elementary Particles	158	16	174
Fluids	16		16
Nuclear Structure	82	6	88
Optics	59	6	65
Plasma	61	4	65
Polymer	20		20
Solid State	218	35	253
Physics, General	248	25	273
Physics, Other	111	12	123
CHEMISTRY	1589	429	2018
Analytical	241	60	301
Inorganic	184	66	250
Nuclear	7		7
Organic	440	89	529
Pharmaceutical	54	19	73
Physical	246	71	317
Polymer	69	12	81
Theoretical	41	9	50
Chemistry, General	241	75	316
Chemistry, Other	66	28	94
EARTH, ATMOSPHERIC AND MARINE SCI	582	144	726
Atmospheric Physics and Chemistry	19		19
Atmospheric Dynamics	23	2	25
Meteorology	28	7	35
Atmos and Meteorological Sci, Gen	13	1	14
Atmos and Meteorological Sci, Other	9	1	10
Geology	107	36	143
Geochemistry	38	7	45
Geophysics and Seismology	75	8	83
Paleontology	21	3	24
Mineralogy, Petrology	16	3	19
Stratigraphy, Sedimentation	22	8	30
Geomorphology and Glacial Geology	5	2	7
Applied Geology	6	1	7
Geological Sciences, General	7	2	9
Geological Sciences, Other	25	6	31
Environmental Sciences	42	16	58
Hydrology and Water Resources	19	5	24
Oceanography	65	17	82
Marine Sciences	19	9	28
Physical Sciences, Other	23	10	33
ENGINEERING	3904	286	4190
Aerospace, Aeronaut & Astronaut	141	9	150
Agricultural	67	3	70
Bioengineering and Biomedical	96	18	114
Ceramic	27	3	30
Chemical	565	60	625
Civil	464	25	489
Communications	21	3	24
Computer	92	7	99
Electrical, Electronics	847	38	885
Engineering Mechanics	103	3	106
Engineering Physics	9		9
Engineering Science	29	3	32
Environmental Health Engineering	38	5	43
Industrial	108	19	127
Materials Science	227	25	252
Mechanical	585	26	611
Metallurgical	87	5	92
Mining and Mineral	16	1	17
Naval Architecture, Marine Eng	9		9
Nuclear	100	4	104
Ocean	21		21
Operations Research	40	4	44
Petroleum	31	2	33
Polymer	25	3	28
Systems Engineering	37	7	44
Engineering, General	47	2	49
Engineering, Other	72	11	83
LIFE SCIENCES	3882	2261	6143
BIOLOGICAL SCIENCES	2605	1501	4106
Biochemistry	410	203	613
Biophysics	76	21	97
Bacteriology	4	2	6
Plant Genetics	20	6	26
Plant Pathology	21	9	30
Plant Physiology	51	22	73
Botany, Other	71	41	112
Anatomy	56	32	88
Biometrics and Biostatistics	32	15	47
Cell Biology	62	55	117
Ecology	108	47	155
Embryology	4	3	7
Endocrinology	11	10	21
Entomology	107	26	133
Immunology	88	90	178
Molecular Biology	233	129	362
Microbiology	213	120	333
Neurosciences	103	58	161
Nutritional Sciences	38	88	126
Parasitology	12	8	20
Toxicology	78	30	108
Human and Animal Genetics	61	57	118
Human and Animal Pathology	69	43	112
Human and Animal Pharmacology	158	91	249
Human and Animal Physiology	136	89	225
Zoology, Other	124	43	167
Biological Sciences, General	162	100	262
Biological Sciences, Other	97	63	160
HEALTH SCIENCES	324	543	867
Audiology and Speech Pathology	32	61	93
Environmental Health	34	18	52
Public Health	48	74	122
Epidemiology	40	58	98
Nursing	11	235	246
Pharmacy	67	28	95
Veterinary Medicine	31	17	48
Health Sciences, General	12	11	23
Health Sciences, Other	49	41	90
AGRICULTURAL SCIENCES	953	217	1170
Agricultural Economics	124	31	155
Animal Breeding and Genetics	25	2	27
Animal Nutrition	42	12	54
Dairy Science	11	1	12
Poultry Science	8	2	10
Fisheries Science	34	8	42
Animal Sciences, Other	73	13	86
Agronomy	122	19	141
Plant Breeding and Genetics	71	12	83
Plant Pathology	34	12	46
Plant Protection-Pest Mgmt	1		1
Plant Sciences, Other	20	3	23
Food Sciences	13	3	16
Food Engineering	5	1	6
Food Sciences, Other	83	36	119
Soil Sciences	17	1	18
Soil Chemistry/Microbiology	26	7	33
Soil Sciences, Other	51	11	62
Horticulture Science	45	16	61

1/ Field groupings may differ from those in reports published by federal sponsors of the Survey of Earned Doctorates. See inside the back cover for a description of fields as reported in this table. Refer also to the explanatory note about this table in front of Appendix A.

Subfield of Doctorate	Number of Doctorates		
	Men	Women	Total
Forestry Science	13	2	15
Forest Biology	18	3	21
Forest Engineering	3		3
Forest Management	16	2	18
Wood Science	7		7
Renewable Natural Resources	7		7
Forestry & Related Sci, Other	29	6	35
Wildlife	3		3
Wildlife/Range Management	28	8	36
Agriculture, General	6	3	9
Agriculture, Other	18	3	21
SOCIAL SCIENCES (INCL PSYCH)	3173	2596	5769
Anthropology	156	169	325
Area Studies	12	5	17
Criminology	28	15	43
Demography	8	11	19
Economics	662	163	825
Econometrics	23	4	27
Geography	97	33	130
International Relations	63	14	77
Political Science and Government	296	95	391
Public Policy Studies	49	25	74
Sociology	211	238	449
Statistics	38	9	47
Urban Studies	55	32	87
Social Sciences, General	15	14	29
Social Sciences, Other	77	94	171
PSYCHOLOGY	1383	1675	3058
Clinical	477	612	1089
Cognitive	49	34	83
Comparative	3	4	7
Counseling	221	261	482
Developmental	45	130	175
Experimental	73	61	134
Educational	38	65	103
Industrial and Organizational	64	53	117
Personality	10	8	18
Physiological	40	45	85
Psychometrics	5	6	11
Quantitative	7	5	12
School	49	66	115
Social	65	75	140
Psychology, General	169	191	360
Psychology, Other	68	59	127
HUMANITIES	1979	1574	3553
History, American	132	77	209
History, European	76	51	127
History of Science	12	10	22
History, General	70	34	104
History, Other	96	45	141
Classics	34	22	56
Comparative Literature	58	81	139
Linguistics	83	83	166
Speech and Debate	21	15	36
Letters, General	9	7	16
Letters, Other	17	26	43
American Studies	27	43	70
Archeology	15	8	23
Art History and Criticism	51	81	132
Music	351	154	505
Philosophy	170	53	223
Religion	170	46	216
Theatre	47	45	92
LANGUAGE AND LITERATURE	497	649	1146
American	94	92	186
English	221	309	530
French	29	71	100
German	35	41	76
Italian	5	9	14
Spanish	53	84	137
Russian	7	6	13
Slavic	2	2	4
Chinese	7	5	12
Japanese	2	4	6
Hebrew	7	4	11
Arabic	11	3	14
Other Languages	24	19	43
Humanities, General	11	13	24
Humanities, Other	32	31	63

Subfield of Doctorate	Number of Doctorates		
	Men	Women	Total
PROFESSIONAL FIELDS	1420	672	2092
BUSINESS ADMINISTRATION	792	247	1039
Accounting	118	56	174
Banking and Finance	126	22	148
Business Admin and Management	212	55	267
Business Economics	25	2	27
Marketing Management and Research	94	32	126
Business Statistics	5	1	6
Operations Research	39	11	50
Organizational Behavior	41	33	74
Business and Management, General	66	14	80
Business and Management, Other	66	21	87
COMMUNICATIONS	151	96	247
Communications Research	48	24	72
Journalism	16	5	21
Radio and Television	10	2	12
Communications, General	38	32	70
Communications, Other	39	33	72
OTHER PROFESSIONAL FIELDS	477	329	806
Architecture, Environmental Design	25	6	31
Home Economics	9	49	58
Law	28	5	33
Library and Archival Science	24	33	57
Public Administration	64	28	92
Social Work	96	140	236
Theology	210	40	250
Professional Fields, General	1	1	2
Professional Fields, Other	20	27	47
EDUCATION	2842	3507	6349
Curriculum and Instruction	307	503	810
Educational Admin and Supervision	927	820	1747
Educational Media	41	26	67
Educational Statistics and Research	24	26	50
Educational Testing, Eval and Meas	29	26	55
Educational Psychology	121	200	321
School Psychology	45	53	98
Social Foundations	66	56	122
Special Education	63	194	257
Student Counseling, Personnel Serv	137	185	322
Higher Education	177	222	399
Pre-elementary Education	10	73	83
Elementary Education	22	71	93
Secondary Education	30	38	68
Adult and Continuing Education	104	125	229
TEACHING FIELDS	448	538	986
Agricultural Education	32		32
Art Education	15	27	42
Business Education	27	17	44
English Education	16	41	57
Foreign Languages Education	17	36	53
Health Education	19	67	86
Home Economics Education		17	17
Industrial Arts Education	9	2	11
Mathematics Education	24	31	55
Music Education	47	29	76
Nursing Education	2	32	34
Physical Education	101	82	183
Reading Education	9	65	74
Science Education	40	27	67
Social Science Education	18	5	23
Speech Education	1	4	5
Technical Education	10	3	13
Trade and Industrial Education	41	26	67
Other Teaching Fields	20	27	47
Education, General	167	196	363
Education, Other	124	155	279
OTHER AND UNSPECIFIED	37	14	51

SOURCE: National Research Council, Office of Scientific and Engineering Personnel, Doctorate Records File.

APPENDIX A, TABLE 1A Number of Doctorate Recipients, by Citizenship, Racial/Ethnic Group, and Subfield, 1988 [1/]

Subfield of Doctorate	Total Doctorates	Non-U.S. Citizens Temp. Visas	U.S. Citizens and Non-U.S. with Permanent Visas								
			Total	Racial/Ethnic Group							
				Amer. Ind.	Asian	Black	White	Puerto Rican	Mexican Amer.	Other Hispanic	Other & Unk
TOTAL ALL FIELDS	33456[2/]	6176	24783	93	1233	951	21353	176	190	327	460
PHYSICAL SCIENCES	5309	1477	3478	11	229	41	3013	24	16	36	108
MATHEMATICS	749	304	384	2	33	3	331	1		3	11
Applied Mathematics	142	62	76		5	1	68	1			1
Algebra	54	21	33			1	32				
Analysis and Functional Analysis	76	22	53		7		44				2
Geometry	44	22	22		2		19				1
Logic	19	8	11				10				1
Number Theory	26	15	11		3		8				
Probability and Math Statistics	152	72	73		8		60			2	3
Topology	27	9	17		1		15				1
Computing Theory and Practice	12	3	8				8				
Operations Research	29	11	18		1		16				1
Mathematics, General	135	47	41	2	4	1	32			1	1
Mathematics, Other	33	12	21		2		19				
COMPUTER SCIENCE	514	174	326	1	44	2	265			2	12
Computer Sciences	442	151	277		37	1	227			2	10
Information Sciences and Systems	72	23	49	1	7	1	38				2
PHYSICS AND ASTRONOMY	1302	421	783	1	52	12	669	3	2	9	35
Astronomy	66	12	50		2		42		1	1	4
Astrophysics	64	8	53		3		50				
Acoustics	16	3	13		1	1	11				
Atomic and Molecular	77	19	57		3	1	52				1
Electron	2		2		1		1				
Elementary Particles	174	61	113		7	3	98	1			4
Fluids	16	6	10		1		9				
Nuclear Structure	88	32	55		3		48			1	3
Optics	65	14	51		7	1	41			1	1
Plasma	65	17	48		3		42		1		2
Polymer	20	11	9		1		8				
Solid State	253	99	154		7	2	132	2		5	6
Physics, General	273	109	86	1	8	2	63				12
Physics, Other	123	30	82		5	2	72			1	2
CHEMISTRY	2018	441	1448	5	85	21	1253	19	10	19	36
Analytical	301	49	250		15	6	216	6	3	2	2
Inorganic	250	43	202	1	5	2	187		1	3	3
Nuclear	7	2	5		1		4				
Organic	529	124	397	1	15	5	353	4	1	6	12
Pharmaceutical	73	19	51		5		43			2	1
Physical	317	72	237	1	14	1	202	6	3	3	7
Polymer	81	32	49		12	1	34				2
Theoretical	50	12	38	1		1	36				
Chemistry, General	316	72	146	1	12	4	115	2	2	3	7
Chemistry, Other	94	16	73		6	1	63	1			2
EARTH, ATMOSPHERIC AND MARINE SCI	726	137	537	2	15	3	495	1	4	3	14
Atmospheric Physics and Chemistry	19	8	11				10		1		
Atmospheric Dynamics	25	7	18		1		17				
Meteorology	35	13	20		1		18				1
Atmos and Meteorological Sci, Gen	14	3	10		1		9				
Atmos and Meteorological Sci, Other	10		9		1		8				
Geology	143	19	108			1	103		1		3
Geochemistry	45	6	37		4		29	1			3
Geophysics and Seismology	83	26	53		2	1	47			1	2
Paleontology	24	2	22				22				
Mineralogy, Petrology	19	2	16				16				
Stratigraphy, Sedimentation	30	3	27				25		1		1
Geomorphology and Glacial Geology	7	1	6				6				
Applied Geology	7	1	6				6				
Geological Sciences, General	9	2	4				4				
Geological Sciences, Other	31	3	28		1		26				1
Environmental Sciences	58	6	48		2	1	43			1	1
Hydrology and Water Resources	24	9	14				13		1		
Oceanography	82	16	55	1	1		52				1
Marine Sciences	28	5	23	1			21			1	
Physical Sciences, Other	33	5	22		1		20				1
ENGINEERING	4190	1723	2144	4	332	31	1651	13	11	39	63
Aerospace, Aeronaut & Astronaut	150	48	81		13	1	66		1		
Agricultural	70	25	45		1		38		3	1	2
Bioengineering and Biomedical	114	24	84		8	1	68	1	1	1	4
Ceramic	30	12	16		3		13				
Chemical	625	208	380	2	59	6	299			5	9
Civil	489	250	212	1	24	1	164	6		7	9
Communications	24	8	15		5		9			1	
Computer	99	57	38		14	1	21				2

1/ Field groupings may differ from those in reports published by federal sponsors of the Survey of Earned Doctorates. See inside the back cover for a description of fields as reported in this table. Refer also to the explanatory note about this table in front of Appendix A.

2/ Includes 2,497 individuals who did not report their citizenship at time of doctorate.

Subfield of Doctorate	Total Doctorates	Non-U.S. Citizens Temp. Visas	U.S. Citizens and Non-U.S. with Permanent Visas								
				Racial/Ethnic Group							
			Total	Amer. Ind.	Asian	Black	White	Puerto Rican	Mexican Amer.	Other His-panic	Other & Unk
Electrical, Electronics	885	354	448		83	6	332	2	2	9	14
Engineering Mechanics	106	53	47		10		34			2	1
Engineering Physics	9	3	6		1		5				
Engineering Science	32	9	17		2		14		1		
Environmental Health Engineering	43	16	22		3		19				
Industrial	127	66	51		11	7	30	2			1
Materials Science	252	99	138		17	1	111	1	1	3	4
Mechanical	611	281	279	1	47	1	218	1	1	3	7
Metallurgical	92	42	45		6	1	35				3
Mining and Mineral	17	9	8		3		5				
Naval Architecture, Marine Eng	9	5	2				2				
Nuclear	104	38	60		3	3	52			2	
Ocean	21	8	8		2		5				1
Operations Research	44	17	26		1	1	23			1	
Petroleum	33	14	16		5	1	9				1
Polymer	28	14	13		4		9				
Systems Engineering	44	18	25		4		19				2
Engineering, General	49	14	26		2		20		1	3	
Engineering, Other	83	31	36		1		31			1	3
LIFE SCIENCES	6143	1062	4687	18	232	103	4146	26	20	63	79
BIOLOGICAL SCIENCES	4106	553	3310	6	170	48	2954	20	14	42	56
Biochemistry	613	109	469		29	7	412	4	4	7	6
Biophysics	97	16	72		6	1	62				3
Bacteriology	6	2	4				4				
Plant Genetics	26	12	14		1		13				
Plant Pathology	30	5	25		1		23			1	
Plant Physiology	73	20	53		4		45			2	2
Botany, Other	112	13	89	1			86		1	1	
Anatomy	88	4	76		1		73		1		1
Biometrics and Biostatistics	47	10	34		2	3	29				
Cell Biology	117	14	96		2	2	89			1	2
Ecology	155	22	129		1		127				1
Embryology	7		7		1		6				
Endocrinology	21	4	17			2	13	2			
Entomology	133	19	107		4	2	97	1	1	2	
Immunology	178	10	164	3	13		143	1	1	1	2
Molecular Biology	362	61	297		19	3	266	2		4	3
Microbiology	333	35	284		11	5	257	1	1	4	5
Neurosciences	161	13	141		11	1	122	3			4
Nutritional Sciences	126	28	92		6	8	75		1	2	
Parasitology	20	4	16			2	13			1	
Toxicology	108	5	95		3	1	86			2	3
Human and Animal Genetics	118	12	97		9	1	83		1	1	2
Human and Animal Pathology	112	13	94		7		84			1	2
Human and Animal Pharmacology	249	20	213		12	1	190	2		4	4
Human and Animal Physiology	225	28	188	1	10	4	166			2	5
Zoology, Other	167	17	144	1	3	5	129	1	1	1	3
Biological Sciences, General	262	34	177		9		155	2	1	3	7
Biological Sciences, Other	160	23	116		5		106	1	1	2	1
HEALTH SCIENCES	867	116	680	5	30	31	596	4	3	5	6
Audiology and Speech Pathology	93	4	85	1	1	1	80				2
Environmental Health	52	7	42		1		41				
Public Health	122	23	86		5	6	71		1	3	
Epidemiology	98	6	85	2	3	2	76	1		1	
Nursing	246	11	222	1	1	15	199	1	2	1	2
Pharmacy	95	33	55		11	2	39	2			1
Veterinary Medicine	48	16	29		1	1	27				
Health Sciences, General	23	3	15		1	1	13				
Health Sciences, Other	90	13	61	1	6	3	50				1
AGRICULTURAL SCIENCES	1170	393	697	7	32	24	596	2	3	16	17
Agricultural Economics	155	48	87	1	2	4	78				2
Animal Breeding and Genetics	27	12	15				13			2	
Animal Nutrition	54	14	39		1	1	34		1	2	
Dairy Science	12	2	8				8				
Poultry Science	10	3	7		2	1	4				
Fisheries Science	42	11	26	1	1		23			1	
Animal Sciences, Other	86	19	59		3	1	50	1		1	3
Agronomy	141	55	79	1	3	5	66			2	2
Plant Breeding and Genetics	83	28	53		1	2	46			3	1
Plant Pathology	46	19	27			1	26				
Plant Protection-Pest Mgmt	1		1				1				
Plant Sciences, Other	23	7	13				12			1	
Food Sciences	16	10	5		2	1	2				
Food Engineering	6	1	5		1		3		1		
Food Sciences, Other	119	58	55	1	10	2	38			1	3
Soil Sciences	18	6	12		1	1	10				
Soil Chemistry/Microbiology	33	10	23				22			1	
Soil Sciences, Other	62	24	33	1	2	1	23	1		1	4
Horticulture Science	61	23	34		1		32		1		

APPENDIX A, TABLE 1A (Continued) 1/

Subfield of Doctorate	Total Doctorates	Non-U.S. Citizens Temp. Visas	U.S. Citizens and Non-U.S. with Permanent Visas								
				Racial/Ethnic Group							
			Total	Amer. Ind.	Asian	Black	White	Puerto Rican	Mexican Amer.	Other Hispanic	Other & Unk
Forestry Science	15	1	14				14				
Forest Biology	21	4	17				17				
Forest Engineering	3		2				2				
Forest Management	18	5	12		1		10				1
Wood Science	7	3	4				4				
Renewable Natural Resources	7	3	4			1	3				
Forestry & Related Sci, Other	35	8	15	1	1		13				
Wildlife	3	1	2				2				
Wildlife/Range Management	36	7	29	1		2	26				
Agriculture, General	9	6	1			1					
Agriculture, Other	21	5	16				14			1	1
SOCIAL SCIENCES (INCL PSYCH)	5769	707	4536	12	143	195	3961	34	47	67	77
Anthropology	325	28	276	2	7	6	240	1	2	10	8
Area Studies	17		13		1	2	10				
Criminology	43	7	32		1	8	22				1
Demography	19	10	9		1		7			1	
Economics	825	290	473		47	15	390	1	4	7	9
Econometrics	27	18	9		2		7				
Geography	130	35	90	1	1		84		1		3
International Relations	77	20	45		2	2	41				
Political Science and Government	391	82	253		6	16	215	2	3	1	10
Public Policy Studies	74	7	61		1	8	49	1			2
Sociology	449	68	342	2	13	22	282	2	6	8	7
Statistics	47	21	23		6		17				
Urban Studies	87	18	54		4	7	41				2
Social Sciences, General	29	5	15			1	10	1	2	1	
Social Sciences, Other	171	14	141		4	8	125		1		3
PSYCHOLOGY	3058	84	2700	7	47	100	2421	26	28	39	32
Clinical	1089	16	975	4	16	42	864	16	11	13	9
Cognitive	83	11	71		3	1	63				4
Comparative	7		7				6			1	
Counseling	482	6	465	1	9	18	421	2	1	7	6
Developmental	175	6	167	1	3	6	154		1	2	
Experimental	134	9	125		4		113	1	1	6	
Educational	103	1	96			8	84		2	1	1
Industrial and Organizational	117	6	109			1	103	2	1		2
Personality	18		17			2	15				
Physiological	85	5	80		3		70		2	3	2
Psychometrics	11	1	10				7	1	1	1	
Quantitative	12	1	11				11				
School	115	2	105			3	101	1			
Social	140	5	134		1	4	121	1	4	1	2
Psychology, General	360	11	220	1	6	15	188	2	3	2	3
Psychology, Other	127	4	108		2		100		1	2	3
HUMANITIES	3553	346	2955	7	69	88	2633	26	23	63	46
History, American	209	8	199		3	5	184		3	2	2
History, European	127	3	124		2		118		2	1	1
History of Science	22		22		1		21				
History, General	104	12	60	1	1	1	50		2		5
History, Other	141	23	115		7	3	98	1	2	2	2
Classics	56	4	48				47			1	
Comparative Literature	139	24	106		4		93	1	3	3	2
Linguistics	166	55	95	1	4	3	77	2	1	5	2
Speech and Debate	36	1	35		1		34				
Letters, General	16		16				16				
Letters, Other	43	4	38			2	33	2		1	
American Studies	70	4	66			9	55		1		1
Archeology	23	1	21	2			18				1
Art History and Criticism	132	5	121		2	2	113	1			3
Music	505	35	406	1	11	11	371	1	2	3	6
Philosophy	223	29	180		3	4	164	2		2	5
Religion	216	20	185		3	4	173	1			4
Theatre	92	3	88		2	8	78				
LANGUAGE AND LITERATURE	1146	112	960	2	22	33	830	15	7	41	10
American	186	15	169	1	1	9	156	1			1
English	530	31	456	1	11	17	415	1	2	2	7
French	100	13	84		3	4	75				2
German	76	11	60		2		57		1		
Italian	14	3	11				11				
Spanish	137	17	114		1	2	58	13	4	36	
Russian	13	3	10				10				
Slavic	4		3				3				
Chinese	12	4	8		3		4			1	
Japanese	6	1	5				5				
Hebrew	11	2	9				9				
Arabic	14	8	5		1		4				
Other Languages	43	4	26			1	23			2	
Humanities, General	24		19			2	17				
Humanities, Other	63	3	51		3	1	43			2	2

1/ Field groupings may differ from those in reports published by federal sponsors of the Survey of Earned Doctorates. See inside the back cover for a description of fields as reported in this table. Refer also to the explanatory note about this table in front of Appendix A.

Subfield of Doctorate	Total Doctorates	Non-U.S. Citizens Temp. Visas	U.S. Citizens and Non-U.S. with Permanent Visas								
				Racial/Ethnic Group							
			Total	Amer. Ind.	Asian	Black	White	Puerto Rican	Mexican Amer.	Other His-panic	Other & Unk
PROFESSIONAL FIELDS	2092	374	1506	6	97	85	1274	8	10	7	19
BUSINESS ADMINISTRATION	1039	255	690	4	65	19	581	2	3	4	12
Accounting	174	36	133	1	10	4	114		1		3
Banking and Finance	148	54	88	1	12	2	70			1	2
Business Admin and Management	267	52	157	1	16	3	131	1	1	1	3
Business Economics	27	8	18		4	1	13				
Marketing Management and Research	126	34	92	1	2	2	85	1			1
Business Statistics	6	2	4		1		2			1	
Operations Research	50	21	26		3		21			1	1
Organizational Behavior	74	4	70		6	5	58				1
Business and Management, General	80	17	43		7		34		1		1
Business and Management, Other	87	27	59		4	2	53				
COMMUNICATIONS	247	27	201		5	11	182		2		1
Communications Research	72	7	63		1	1	61				
Journalism	21	7	14			3	11				
Radio and Television	12	1	10		1	1	8				
Communications, General	70	7	57		1	2	52		1		1
Communications, Other	72	5	57		2	4	50		1		
OTHER PROFESSIONAL FIELDS	806	92	615	2	27	55	511	6	5	3	6
Architecture, Environmental Design	31	13	15		2	2	9	1			1
Home Economics	58	7	50			4	45	1			
Law	33	13	9		2		7				
Library and Archival Science	57	12	44		2	10	31			1	
Public Administration	92	12	64	1	4	3	52	1	1	1	1
Social Work	236	13	177		9	25	136	1	3		3
Theology	250	15	216		6	6	200	1	1	1	1
Professional Fields, General	2		2				2				
Professional Fields, Other	47	7	38	1	2		29	1			
EDUCATION	6349	479	5446	35	170	408	4646	45	63	51	68
Curriculum and Instruction	810	64	715	2	20	38	620	13	8	6	8
Educational Admin and Supervision	1747	71	1566	9	27	134	1343	4	18	9	22
Educational Media	67	17	49	2	1	5	39			1	1
Educational Statistics and Research	50	8	39		2	3	32		1		1
Educational Testing, Eval and Meas	55	9	45		5		37	1		1	1
Educational Psychology	321	18	299	3	8	14	262	1	3	4	4
School Psychology	98	1	96	1		5	82	4	2	2	
Social Foundations	122	14	103		4	9	86		2	1	1
Special Education	257	16	236	3	3	11	210	2	1	3	3
Student Counseling, Personnel Serv	322	13	286		3	22	252	1	3	4	1
Higher Education	390	34	348	7	6	36	283	2	6	3	5
Pre-elementary Education	83	9	55		4	7	42		1	1	
Elementary Education	93	3	85			5	76			3	1
Secondary Education	68	3	51		3	8	39	1			
Adult and Continuing Education	229	23	196	3	3	13	172	1	2	1	1
TEACHING FIELDS	986	127	818	2	24	56	704	10	10	5	7
Agricultural Education	32	6	23			3	19				1
Art Education	42	8	33	1	1	2	26		2		1
Business Education	44	4	39	1	1	1	33	1		1	1
English Education	57	3	53		3	3	44			1	2
Foreign Languages Education	53	14	38		3	2	28	2	3		
Health Education	86	4	76		2	3	67		3	1	
Home Economics Education	17	3	13		1	4	8				
Industrial Arts Education	11	3	8		1	1	6				
Mathematics Education	55	9	46		2	5	37	1	1		
Music Education	76	7	66		1	4	59	1		1	
Nursing Education	34	2	32		1	3	27	1			
Physical Education	183	27	147		1	5	140			1	
Reading Education	74	2	70		2	8	57	2			1
Science Education	67	13	52			1	50				1
Social Science Education	23	3	18		1	1	15		1		
Speech Education	5		4			1	3				
Technical Education	13	1	12			1	11				
Trade and Industrial Education	67	11	50		2	4	44				
Other Teaching Fields	47	7	38		2	4	30	2			
Education, General	363	24	226	2	7	21	176	4	3	5	8
Education, Other	279	25	233	1	10	21	191	1	3	2	4
OTHER AND UNSPECIFIED	51	8	31		1		29			1	

SOURCE: National Research Council, Office of Scientific and Engineering Personnel, Doctorate Records File.

APPENDIX A, TABLE 2 Statistical Profile of Doctorate Recipients, by Field of Doctorate, 1988 1/

Total All Doctorates

		1988 Total	Physics and Astronomy	Chemistry	Earth, Atmos., and Marine Sci.	Mathematics	Computer Sciences	Physical Sciences	Engineering	Biochemistry	Other Biosciences	Biosciences	Health Sciences	Agricultural Sciences	Life Sciences
Number in Field		33456	1302	2018	726	749	514	5309	4190	613	3493	4106	867	1170	6143
Male	%	64.8	90.0	78.7	80.2	83.8	89.1	83.4	93.2	66.9	62.8	63.4	37.4	81.5	63.2
Female		35.2	10.0	21.3	19.8	16.2	10.9	16.6	6.8	33.1	37.2	36.6	62.6	18.5	36.8
U.S. Citizenship	%	69.3	55.4	68.0	69.8	45.5	55.3	60.8	42.4	71.5	76.8	76.0	74.4	52.9	71.3
Non-U.S., Permanent Visa		4.8	4.8	3.7	4.1	5.7	8.2	4.7	8.7	5.1	4.6	4.7	4.0	6.7	4.9
Non-U.S., Temporary Visa		18.5	32.3	21.9	18.9	40.6	33.9	27.8	41.1	17.8	12.7	13.5	13.4	33.6	17.3
Unknown		7.5	7.5	6.4	7.2	8.1	2.7	6.7	7.7	5.7	6.0	5.9	8.2	6.8	6.4
Married	%	57.4	47.9	51.5	57.2	49.9	59.3	51.9	59.0	50.2	52.1	51.8	58.8	64.5	55.2
Not Married		33.9	43.1	41.0	34.3	41.3	35.8	40.1	32.1	43.2	40.8	41.1	32.4	26.8	37.2
Unknown		8.7	9.0	7.4	8.5	8.8	4.9	7.9	8.9	6.5	7.2	7.1	8.8	8.7	7.6
Median Age at Doct.	Yrs	33.8	30.0	29.3	32.3	30.9	32.3	30.3	31.0	30.0	31.2	31.0	36.2	33.2	31.9
Percent with Bacc in Same Field as Doctorate		54.7	72.8	80.0	51.7	70.4	21.6	67.3	76.4	25.8	60.9	55.7	51.2	57.4	55.4
Percent with Masters		78.0	64.3	37.0	77.3	74.9	83.9	59.1	85.3	30.2	52.6	49.3	84.3	89.4	61.9
Median Time Lapse From Bacc to Doct															
Total Time	Yrs	10.5	7.3	6.4	9.3	8.0	9.5	7.4	8.1	7.1	8.3	8.2	12.8	9.7	8.9
Registered Time		6.9	6.3	5.5	7.1	6.3	6.6	6.1	5.9	6.1	6.6	6.5	7.1	6.3	6.5
Postdoctoral Study Plans	%	23.5	58.3	52.6	36.5	20.7	10.9	43.3	19.5	80.1	66.8	68.8	17.3	25.1	53.2
Fellowship		11.4	20.5	24.3	14.3	7.7	2.3	17.6	5.2	51.9	39.8	41.6	9.5	8.5	30.8
Research Assoc		9.7	36.4	26.9	21.5	10.7	7.2	24.3	12.6	22.7	20.0	20.4	5.8	15.5	17.4
Traineeship		1.0	0.9	0.6	0.3	1.2	0.4	0.7	1.3	1.5	2.1	2.0	0.9	0.7	1.6
Other Study		1.3	0.5	0.8	0.4	1.1	1.0	0.7	0.4	4.1	5.0	4.8	1.2	0.5	3.5
Planned Employment After Doctorate	%	66.1	30.6	39.3	52.3	67.3	83.1	47.1	69.1	12.6	25.1	23.3	72.8	63.1	37.8
Educ Institution 2/		39.2	8.5	7.8	21.8	52.9	49.4	20.3	24.0	4.6	13.5	12.1	43.4	29.6	19.9
Industry/Business		13.2	15.0	27.8	15.2	9.6	26.7	20.3	34.5	5.2	5.4	5.3	10.1	12.2	7.3
Government		6.2	5.1	2.0	11.7	2.1	5.1	4.4	7.2	1.5	3.6	3.3	9.3	14.4	6.3
Nonprofit		4.3	0.8	0.7	1.1	0.8	1.0	0.8	0.7	0.5	1.2	1.1	5.8	2.3	2.0
Other & Unknown		3.1	1.2	0.9	2.6	1.9	1.0	1.4	2.6	0.8	1.5	1.4	4.2	4.6	2.4
Postdoc Status Unknown	%	10.5	11.1	8.1	11.2	12.0	6.0	9.6	11.4	7.3	8.0	7.9	9.9	11.8	9.0
Definite Postdoct Study	%	17.3	44.8	42.9	23.6	13.6	8.4	33.2	11.7	68.5	53.1	55.4	12.1	16.7	41.9
Seeking Postdoct Study		6.2	13.5	9.8	12.9	7.1	2.5	10.0	7.7	11.7	13.7	13.4	5.2	8.5	11.3
Definite Employment		48.1	21.1	31.1	37.2	47.4	64.4	35.0	47.4	9.3	17.3	16.1	55.0	45.5	27.2
Seeking Employment		17.9	9.4	8.2	15.2	19.9	18.7	12.1	21.7	3.3	7.8	7.1	17.8	17.6	10.6
Employment Activity After Doctorate															
Primary Activity															
R & D	%	28.3	74.2	73.9	55.9	38.0	59.5	61.9	64.0	66.7	40.5	42.7	31.7	58.6	44.6
Teaching		36.3	14.9	15.1	20.7	50.1	27.2	24.7	20.6	21.1	29.9	29.2	40.7	17.5	28.7
Administration		13.2	1.8	0.5	3.7	0.8	3.3	1.7	2.1	1.8	4.6	4.4	11.1	3.0	5.9
Prof. Services		13.0	2.2	3.8	8.9	2.5	2.7	3.9	5.1	5.3	13.7	13.0	9.0	6.6	9.8
Other		3.1	1.8	1.9	5.6	0.6	1.2	2.0	2.2	0.0	4.5	4.1	1.3	4.7	3.5
Secondary Activity															
R & D		25.6	14.5	10.7	24.4	40.6	24.2	21.4	19.6	21.1	29.5	28.9	33.3	18.6	26.9
Teaching		14.7	10.5	3.7	14.1	23.4	29.3	14.5	13.9	10.5	14.7	14.4	14.7	16.7	15.2
Administration		8.5	9.1	15.1	12.6	2.3	5.7	9.7	8.7	10.5	8.6	8.8	8.8	9.8	9.1
Prof. Services		7.0	5.8	7.3	7.0	4.5	3.6	5.9	6.7	3.5	5.5	5.3	9.4	8.1	7.4
Other		1.9	1.1	1.3	0.4	0.3	0.9	0.9	1.4	1.8	1.0	1.1	0.2	2.4	1.3
No Secondary Activity		36.1	53.8	57.2	36.3	21.1	30.2	42.0	43.7	47.4	33.9	35.0	27.3	34.8	32.7
Activity(ies) Unknown		6.1	5.1	4.8	5.2	7.9	6.0	5.7	6.0	5.3	6.8	6.6	6.3	9.6	7.5
Region of Employment After Doctorate															
New England	%	6.2	6.2	6.1	8.1	6.5	5.7	6.4	5.5	3.5	5.5	5.3	4.6	3.0	4.4
Middle Atlantic		15.1	17.1	22.6	6.3	13.2	18.4	16.9	15.8	21.1	11.9	12.7	13.2	6.0	10.7
East No Central		12.9	7.3	17.4	11.1	14.1	11.8	13.3	11.3	14.0	12.2	12.4	12.4	8.8	11.3
West No Central		6.0	3.6	5.1	4.1	5.9	2.1	4.4	3.5	3.5	7.1	6.8	6.1	10.0	7.6
South Atlantic		15.7	10.5	17.0	12.6	11.8	13.6	13.8	13.0	21.1	15.5	16.0	17.0	10.0	14.4
East So Central		4.1	2.9	1.9	2.6	2.5	1.5	2.2	3.5	1.8	3.8	3.6	4.2	3.2	3.7
West So Central		7.4	5.1	4.5	8.5	7.3	5.1	5.8	6.7	1.8	5.8	5.4	11.3	6.0	7.3
Mountain		4.8	8.0	2.7	9.3	4.2	6.3	5.4	5.2	1.8	4.5	4.2	4.6	4.7	4.5
Pacific & Insular		10.9	24.0	10.4	15.9	13.5	21.5	15.8	14.0	12.3	10.6	10.7	10.3	8.6	9.9
Foreign		9.7	9.1	6.5	14.4	14.9	8.2	10.0	14.7	12.3	16.5	16.2	10.7	34.4	20.4
Region Unknown		7.1	6.2	5.9	7.0	5.9	5.7	6.1	6.7	7.0	6.6	6.6	5.7	5.3	5.9

1/ Field groupings may differ from those in reports published by federal sponsors of the Survey of Earned Doctorates. See inside the back cover for a description of fields as reported in this table. Beginning with this report, Table 2 no longer includes an EMP subtotal. The Physical Sciences subtotal now includes Mathematics and Computer Sciences, as well as Physics/Astronomy, Chemistry, and Earth/Atmospheric/Marine Sciences. The table as displayed in past reports is available from the Doctorate Records Project office. Refer also to the explanatory note about this table in front of Appendix A.

2/ Includes 2-year, 4-year, and foreign colleges and universities, medical schools, and elementary/secondary schools.

Psychology	Economics	Anthropology and Sociology	Political Sci. & Internat'l Rel.	Other Social Sciences	Social Sciences Exc. Psychology	Total Sciences	History	Eng. and Amer. Lang. and Lit.	Foreign Lang. and Lit.	Other Humanities	Humanities	Business and Management	Other Professional Fields	Education	Total Non-Sciences	Other or Unspecified 1/
3058	852	774	468	617	5769	21411	603	716	430	1804	3553	1039	1053	6349	11994	51
45.2	80.4	47.4	76.7	61.4	55.0	71.9	64.0	44.0	42.3	60.8	55.7	76.2	59.6	44.8	52.0	72.5
54.8	19.6	52.6	23.3	38.6	45.0	28.1	36.0	56.0	57.7	39.2	44.3	23.8	40.4	55.2	48.0	27.5
86.4	50.0	74.4	57.5	65.3	74.8	64.0	82.4	84.2	64.0	78.3	78.4	58.5	73.3	83.1	78.7	
1.9	6.6	5.4	6.2	5.7	3.8	5.3	3.8	3.1	14.0	3.5	4.7	7.9	4.2	2.7	3.9	
2.7	36.2	12.4	21.8	19.0	12.3	23.2	7.6	6.4	15.3	10.4	9.7	24.5	11.3	7.5	10.0	
9.0	7.3	7.8	14.5	10.0	9.1	7.5	6.1	6.3	6.7	7.8	7.1	9.0	11.2	6.7	7.4	
51.0	56.2	57.0	52.8	57.9	53.5	54.7	57.9	53.2	56.7	54.3	55.0	67.9	59.3	66.2	62.4	
39.1	34.9	34.5	31.2	30.5	36.3	36.7	34.5	39.2	34.9	36.4	36.5	22.1	28.0	25.8	28.8	
9.8	8.9	8.5	16.0	11.7	10.2	8.6	7.6	7.5	8.4	9.3	8.5	10.0	12.7	8.1	8.8	
33.6	31.9	36.3	34.2	36.3	34.1	31.8	35.9	35.5	35.5	35.2	35.4	34.8	37.9	40.5	38.3	
61.8	61.7	49.4	46.4	20.4	54.5	62.2	57.5	66.3	58.6	52.2	56.7	36.9	23.6	36.9	41.6	
7[illegible]1	70.2	88.2	85.5	87.5	79.4	70.5	89.4	89.1	90.0	87.5	88.4	84.6	92.8	94.2	91.5	
10.1	8.7	12.3	10.5	12.6	10.5	8.7	12.5	12.4	11.7	12.1	12.2	11.6	14.6	16.9	14.8	
7.2	6.4	9.0	7.8	7.7	7.4	6.5	9.2	8.1	8.3	8.5	8.5	6.9	7.9	8.1	8.1	
18.6	4.8	15.5	8.3	11.3	14.5	33.7	9.3	4.3	9.3	7.2	7.2	2.1	3.8	4.8	5.2	
10.9	1.8	9.2	5.8	6.0	8.4	16.4	5.1	2.8	5.1	3.8	4.0	0.5	1.3	2.0	2.4	
4.3	2.1	4.3	1.5	4.2	3.7	14.5	2.3	0.7	2.1	1.4	1.5	0.7	1.0	1.3	1.3	
2.2	0.6	1.0	0.2	0.5	1.5	1.3	0.3	0.0	0.5	0.4	0.3	0.5	0.7	0.6	0.5	
1.2	0.4	1.0	0.9	0.6	1.0	1.5	1.5	0.8	1.6	1.5	1.4	0.5	0.8	0.9	1.0	
70.6	84.2	73.5	72.6	74.7	73.6	55.9	81.3	86.2	81.4	81.9	82.6	86.6	81.8	85.2	84.3	
24.3	57.7	48.8	53.2	42.6	36.8	25.3	62.4	75.7	71.6	62.1	66.1	75.6	50.1	63.1	63.9	
16.1	7.7	6.6	4.7	10.9	12.1	17.1	5.0	4.6	2.8	6.6	5.5	7.8	7.2	6.3	6.3	
9.7	10.4	4.4	8.8	8.3	8.9	6.7	5.6	0.6	1.4	2.1	2.3	1.9	7.0	7.4	5.4	
15.4	.9	8.3	1.3	7.0	10.4	3.7	4.5	1.1	1.4	7.2	4.8	0.5	14.9	4.9	5.4	
5.0	6.3	5.4	4.7	6.0	5.4	3.0	3.8	4.2	4.2	3.9	4.0	0.9	2.5	3.5	3.3	
10.9	11.0	11.0	19.0	13.9	11.9	10.4	9.5	9.5	9.3	10.9	10.2	11.3	14.4	10.0	10.6	
13.9	2.7	8.1	3.6	7.3	9.9	25.2	4.8	2.9	5.3	3.9	4.1	1.7	1.8	3.0	3.1	
4.7	2.1	7.4	4.7	4.1	4.6	8.5	4.5	1.4	4.0	3.2	3.2	0.4	2.0	1.8	2.1	
51.4	66.8	45.7	51.3	52.2	53.0	40.0	54.2	55.6	54.7	53.8	54.3	73.7	66.2	64.8	62.6	
19.2	17.4	27.8	21.4	22.5	20.6	15.8	27.0	30.6	24.7	28.1	28.3	12.9	15.6	20.4	21.7	
14.3	42.7	29.1	18.3	24.5	22.7	45.0	7.0	3.5	8.9	7.2	6.6	32.0	11.9	5.5	9.1	
14.8	42.5	48.0	60.0	37.3	29.7	26.3	65.4	76.9	78.3	67.0	70.2	57.7	46.6	35.5	47.7	
5.5	3.3	9.0	6.3	12.1	6.3	4.2	8.6	5.8	2.1	5.4	5.6	3.7	13.1	37.4	23.5	
59.3	4.2	6.5	2.5	12.7	33.5	15.9	5.5	3.0	0.9	8.3	5.9	1.7	16.6	11.8	9.7	
2.7	3.2	3.1	6.3	5.9	3.4	2.9	5.5	4.0	3.0	6.2	5.2	1.4	5.2	2.5	3.3	
22.0	34.3	38.1	42.9	32.9	29.0	24.7	37.6	41.0	49.8	37.1	39.5	46.9	27.4	16.8	26.7	
16.1	25.3	14.7	13.8	17.1	17.6	15.6	8.6	9.0	5.1	9.5	8.7	27.8	16.9	12.6	13.6	
9.5	5.4	7.9	5.0	6.5	7.9	8.7	7.6	3.8	5.5	7.1	6.3	3.8	10.5	9.7	8.3	
7.8	4.2	6.2	3.3	6.8	6.5	6.6	2.8	1.0	1.3	4.6	3.2	1.8	8.5	10.5	7.5	
3.1	0.9	2.5	1.3	0.9	2.3	1.6	1.5	3.3	0.9	5.4	3.7	1.4	3.6	1.7	2.4	
37.8	25.8	26.3	27.1	28.3	32.4	37.2	33.9	35.2	30.6	30.5	32.1	14.8	26.5	41.5	35.0	
3.6	4.0	4.2	6.7	7.5	4.4	5.7	8.0	6.8	6.8	5.9	6.5	3.5	6.6	7.2	6.6	
7.6	8.1	7.2	7.9	5.9	7.6	6.2	7.0	8.3	11.5	8.2	8.4	6.1	5.5	5.3	6.2	
21.2	16.2	17.2	12.9	13.4	18.3	15.9	15.9	21.1	16.6	12.9	15.5	16.0	12.8	13.8	14.2	
13.0	11.4	12.7	15.0	11.5	12.7	12.2	13.1	15.8	16.6	13.8	14.4	15.9	13.9	12.9	13.7	
6.4	3.7	6.5	4.2	4.0	5.5	5.2	4.6	3.5	8.9	8.7	6.9	6.4	7.3	7.1	7.0	
14.3	22.1	13.8	17.5	21.4	16.7	14.8	17.4	17.8	13.2	13.7	15.1	14.8	14.6	18.3	16.8	
3.6	2.3	2.5	2.9	3.1	3.1	3.1	4.3	5.0	4.7	4.2	4.5	5.5	7.2	5.1	5.2	
7.5	5.1	5.6	7.5	3.7	6.4	6.5	8.0	5.8	5.1	9.2	7.8	8.9	12.3	8.1	8.5	
4.5	1.6	6.5	3.8	4.7	4.2	4.7	4.0	3.0	3.0	3.7	3.5	5.0	2.6	6.1	5.0	
11.6	9.0	11.3	6.7	11.2	10.7	12.4	12.8	7.8	8.9	10.7	10.3	9.4	7.5	8.9	9.1	
1.2	15.6	9.6	14.6	14.6	7.3	12.2	5.8	5.8	6.4	7.4	6.7	9.8	9.5	5.8	6.8	
8.9	4.9	5.9	7.1	6.5	7.4	6.7	7.0	6.0	5.1	7.5	6.8	4.3	6.9	8.8	7.6	

1/ Statistics are not presented for this group because too few records contained the specific data.

SOURCE: National Research Council, Office of Scientific and Engineering Personnel, Doctorate Records File.

APPENDIX A, TABLE 2 (Continued) 1/

Doctorates: Men

		1988 Total	Physics and Astronomy	Chemistry	Earth, Atmos. and Marine Sci.	Mathematics	Computer Sciences	Physical Sciences	Engineering	Biochemistry	Other Biosciences	Biosciences	Health Sciences	Agricultural Sciences	Life Sciences
Total Male		21666	1172	1589	582	628	458	4429	3904	410	2195	2605	324	953	3882
Male as a Percent of Total Doctorates	%	64.8	90.0	78.7	80.2	83.8	89.1	83.4	93.2	66.9	62.8	63.4	37.4	81.5	63.2
U.S. Citizenship	%	63.1	56.7	67.1	67.4	44.9	53.5	59.8	41.0	71.7	75.6	75.0	60.2	50.3	67.7
Non-U.S., Permanent Visa		5.3	3.8	3.3	4.5	5.1	7.6	4.3	8.9	4.6	4.2	4.3	6.2	7.1	5.1
Non-U.S., Temporary Visa		23.6	31.6	23.0	21.3	41.7	36.2	29.1	42.3	17.6	14.1	14.7	22.8	35.5	20.5
Unknown		7.9	7.9	6.6	6.9	8.3	2.6	6.8	7.8	6.1	6.1	6.1	10.8	7.1	6.7
Married	%	60.3	48.1	52.5	58.4	48.7	60.7	52.4	59.9	51.0	54.4	53.9	64.2	67.5	58.1
Not Married		30.6	42.4	39.9	33.5	42.0	34.5	39.5	31.2	42.2	38.3	38.9	24.1	23.4	33.8
Unknown		9.2	9.5	7.6	8.1	9.2	4.8	8.1	8.9	6.8	7.3	7.2	11.7	9.1	8.1
Median Age at Doct.	Yrs	33.0	30.0	29.5	32.4	30.9	32.1	30.4	31.2	30.0	31.4	31.2	34.8	33.5	31.9
Percent with Bacc in Same Field as Doctorate		56.9	72.1	79.6	53.4	69.7	21.8	66.8	77.2	25.1	60.3	54.7	35.8	59.7	54.4
Percent with Masters		76.5	64.4	37.1	78.2	74.0	83.4	59.8	85.6	29.5	53.5	49.7	77.8	89.7	61.9
Median Time Lapse From Bacc to Doct															
Total Time	Yrs	9.7	7.3	6.5	9.4	7.9	9.3	7.5	8.2	7.1	8.3	8.1	11.4	9.8	8.6
Registered Time		6.7	6.3	5.5	7.1	6.3	6.6	6.2	5.9	6.1	6.6	6.5	7.0	6.3	6.5
Postdoctoral Study Plans	%	25.2	57.0	52.9	36.8	22.0	11.1	43.1	19.3	80.0	66.5	68.6	21.6	23.9	53.7
Fellowship		11.5	19.9	25.1	13.1	8.3	2.4	17.4	5.0	52.4	37.1	39.5	12.3	8.3	29.6
Research Assoc		11.4	35.8	26.3	22.9	11.1	7.4	24.3	12.5	20.0	21.2	21.0	6.5	14.4	18.2
Traineeship		1.0	0.9	0.7	0.3	1.4	0.4	0.8	1.4	1.7	2.2	2.1	1.2	0.6	1.7
Other		1.3	0.4	0.8	0.5	1.1	0.9	0.7	0.3	5.9	6.0	6.0	1.5	0.6	4.3
Planned Employment After Doctorate	%	63.9	31.3	39.1	52.2	65.9	83.0	47.1	69.2	12.9	25.6	23.6	66.0	64.1	37.1
Educ. Institution 2/		35.7	8.4	7.2	20.6	52.7	47.8	19.9	24.1	4.1	13.3	11.9	32.4	30.5	18.2
Industry/Business		15.3	15.4	28.4	16.0	8.9	27.9	20.5	34.5	5.6	5.1	5.2	15.4	12.5	7.9
Government		6.7	5.5	2.1	12.2	2.1	5.0	4.6	7.3	1.7	4.1	3.7	12.3	14.3	7.0
Nonprofit		3.7	0.9	0.6	0.9	0.6	1.1	0.7	0.6	0.5	1.6	1.5	2.2	2.1	1.7
Other & Unknown		2.5	1.2	0.9	2.6	1.6	1.1	1.3	2.7	1.0	1.4	1.3	3.7	4.7	2.4
Postdoc Status Unknown	%	10.9	11.7	8.0	11.0	12.1	5.9	9.7	11.6	7.1	7.9	7.8	12.3	12.0	9.2
Definite Postdoct Study	%	18.6	44.5	42.6	23.7	14.6	8.3	33.1	11.4	69.5	53.7	56.2	15.4	16.3	43.0
Seeking Postdoct Study		6.6	12.5	10.3	13.1	7.3	2.8	10.0	7.9	10.5	12.8	12.4	6.2	7.7	10.7
Definite Employment		47.3	22.0	32.0	37.5	47.0	64.0	35.5	48.0	9.0	18.7	17.2	52.8	46.8	27.4
Seeking Employment		16.6	9.3	7.1	14.8	18.9	19.0	11.6	21.2	3.9	6.9	6.4	13.3	17.3	9.7
Employment Activity After Doctorate															
Primary Activity															
R & D	%	34.9	74.0	75.4	55.5	36.6	62.5	62.7	64.0	67.6	39.9	42.2	44.4	60.1	50.0
Teaching		33.2	14.3	13.9	20.2	50.8	26.3	24.1	20.6	18.9	26.8	26.1	24.6	16.6	21.9
Administration		11.5	1.9	0.6	4.1	0.7	3.1	1.8	2.1	2.7	4.9	4.7	6.4	2.2	3.9
Prof. Services		10.8	2.3	3.3	10.6	2.0	2.4	3.8	4.9	3.4	15.1	14.3	10.5	5.8	10.1
Other		3.3	1.9	1.8	5.0	0.3	1.0	1.8	2.2	0.0	5.4	4.9	2.9	4.9	4.6
Secondary Activity															
R & D		24.5	14.0	10.8	24.3	40.3	23.2	21.0	19.5	16.2	27.7	26.8	18.1	17.3	21.4
Teaching		15.2	10.9	3.9	12.8	23.1	30.7	14.9	13.7	16.2	13.6	13.8	18.1	17.7	16.2
Administration		8.9	9.3	15.9	13.3	2.0	6.1	10.0	8.8	10.8	9.0	9.2	13.5	10.3	10.3
Prof. Services		6.8	5.8	7.9	6.4	4.7	4.1	6.0	6.9	2.7	5.6	5.4	11.7	8.7	7.8
Other		1.8	1.2	1.6	0.5	0.3	1.0	1.0	1.3	2.7	0.7	0.9	0.0	2.2	1.3
No Secondary Activity		36.4	53.5	55.0	38.1	20.0	30.0	41.2	43.6	45.9	35.3	36.2	27.5	33.4	33.6
Activity Unknown		6.5	5.4	4.9	4.6	9.5	4.8	5.8	6.2	5.4	8.0	7.8	11.1	10.3	9.4
Region of Employment After Doctorate															
New England	%	6.0	5.8	6.7	7.3	6.1	5.8	6.4	5.2	5.4	5.1	5.1	4.7	2.7	4.0
Middle Atlantic		14.3	17.1	22.0	7.3	12.5	16.7	16.4	15.4	16.2	11.4	11.8	9.9	5.8	9.0
East No Central		12.8	7.4	16.9	8.7	13.6	12.3	12.7	11.5	18.9	11.9	12.5	8.2	8.1	10.0
West No Central		6.2	3.5	4.9	4.6	6.1	2.0	4.3	3.4	2.7	7.1	6.7	7.6	10.8	8.5
South Atlantic		14.6	10.5	16.5	13.3	11.2	12.3	13.3	13.1	13.5	14.4	14.3	15.2	8.7	12.1
East So Central		4.0	3.1	2.2	3.2	2.7	1.7	2.5	3.6	2.7	3.6	3.6	3.5	3.4	3.5
West So Central		7.2	5.4	4.3	8.3	7.5	5.5	5.8	6.6	2.7	6.1	5.8	11.1	5.6	6.6
Mountain		4.9	8.1	2.8	10.1	4.4	5.8	5.5	5.2	2.7	4.4	4.2	3.5	4.9	4.4
Pacific & Insular		11.2	24.8	11.0	15.1	13.6	22.2	16.4	14.0	8.1	12.7	12.3	8.8	7.8	9.9
Foreign		12.4	8.9	7.5	15.6	15.6	9.2	10.7	15.3	16.2	17.8	17.6	19.3	37.0	26.0
Region Unknown		6.5	5.4	5.3	6.4	6.8	6.5	6.0	6.7	10.8	5.6	6.0	8.2	5.2	6.0

1/ Field groupings may differ from those in reports published by federal sponsors of the Survey of Earned Doctorates. See inside the back cover for a description of fields as reported in this table. Beginning with this report, Table 2 no longer includes an EMP subtotal. The Physical Sciences subtotal now includes Mathematics and Computer Sciences, as well as Physics/Astronomy, Chemistry, and Earth/Atmospheric/Marine Sciences. The table as displayed in past reports is available from the Doctorate Records Project office. Refer also to the explanatory note about this table in front of Appendix A.

2/ Includes 2-year, 4-year, and foreign colleges and universities, medical schools, and elementary/secondary schools.

Psychology	Economics	Anthropology and Sociology	Political Sci. & Internat'l Rel.	Other Social Sciences	Social Sciences Inc. Psychology	Total Sciences	History	Eng. and Amer. Lang. and Lit.	Foreign Lang. and Lit.	Other Humanities	Humanities	Business and Management	Other Professional Fields	Education	Total Non-Sciences	Other or Unspecified 1/
1383	685	367	359	379	3173	15388	386	315	182	1096	1979	792	628	2842	6241	37
45.2	80.4	47.4	76.7	61.4	55.0	71.9	64.0	44.0	42.3	60.8	55.7	76.2	59.6	44.8	52.0	72.5
85.2	46.7	70.8	51.8	58.8	68.3	58.8	79.5	83.2	61.5	77.5	77.3	52.8	68.6	78.3	73.8	
1.9	6.4	6.0	7.5	6.9	4.6	5.7	4.4	1.6	10.4	3.1	3.8	8.6	5.3	3.4	4.4	
3.5	39.0	14.2	24.5	22.4	17.0	27.8	9.3	7.6	19.8	10.6	10.7	29.7	13.7	10.8	13.4	
9.4	7.9	9.0	16.2	11.9	10.1	7.7	6.7	7.6	8.2	8.9	8.2	9.0	12.4	7.5	8.4	
56.2	57.7	61.9	55.4	61.5	57.7	56.8	62.2	51.1	58.8	59.3	58.5	71.6	69.1	75.3	68.9	
33.9	32.8	27.8	27.3	24.8	31.1	34.2	29.5	39.4	31.3	30.7	31.9	18.8	17.5	15.9	21.5	
9.9	9.5	10.4	17.3	13.7	11.2	8.9	8.3	9.5	9.9	10.0	9.6	9.6	13.4	8.8	9.6	
33.4	32.0	35.4	34.4	35.8	33.7	31.6	36.0	34.6	35.8	35.0	35.1	34.9	37.2	40.0	37.5	
66.1	60.3	48.8	46.5	25.3	55.8	64.0	59.6	64.1	51.6	53.9	56.4	37.0	23.4	32.4	39.7	
76.7	69.3	86.9	84.4	88.1	78.5	70.7	90.2	86.0	87.9	87.8	88.0	84.5	91.4	94.3	90.7	
9.9	8.8	11.8	10.7	12.1	10.3	8.4	12.2	11.5	11.4	11.9	11.9	11.7	13.7	16.5	14.1	
7.3	6.4	8.7	7.9	7.6	7.3	6.3	9.1	7.8	7.8	8.4	8.3	6.9	8.0	8.2	8.0	
17.6	5.1	16.3	7.5	9.5	12.7	33.5	9.6	5.1	11.5	5.2	6.6	2.5	2.7	5.1	5.0	
10.7	1.9	9.3	5.6	4.7	7.3	15.3	4.9	4.4	6.0	3.0	3.9	0.5	1.1	2.1	2.4	
4.3	2.2	5.4	0.8	3.7	3.5	15.5	2.6	0.6	2.2	0.9	1.3	0.9	0.6	1.5	1.3	
2.0	0.6	0.8	0.3	0.3	1.1	1.2	0.5	0.0	0.5	0.3	0.3	0.5	0.3	0.6	0.5	
0.7	0.4	0.8	0.8	0.8	0.7	1.5	1.6	0.0	2.7	1.0	1.1	0.6	0.6	0.9	0.9	
71.1	83.4	71.9	71.0	75.5	74.4	55.8	81.1	85.1	79.1	83.2	82.7	86.4	81.1	84.3	83.8	
23.3	35.9	49.0	50.4	46.4	39.1	24.5	63.2	76.5	71.4	63.1	66.0	74.2	45.9	62.1	63.3	
16.8	8.5	5.7	4.2	10.6	11.5	19.0	4.9	3.5	2.7	5.7	5.0	8.7	6.8	5.8	6.0	
12.9	10.5	5.2	10.6	8.7	10.7	7.2	6.5	1.3	0.5	2.1	2.7	2.3	8.0	8.3	5.7	
14.6	1.9	7.4	1.4	5.8	8.5	2.5	3.1	1.3	2.2	8.7	5.8	0.6	19.7	5.8	6.6	
3.5	6.6	4.6	4.5	4.0	4.5	2.6	3.4	2.5	2.2	3.6	3.2	0.5	0.6	2.3	2.2	
11.2	11.5	11.7	21.4	15.0	13.0	10.7	9.3	9.8	9.3	11.6	10.7	11.1	16.2	10.6	11.2	
12.9	2.6	7.9	2.8	6.3	8.2	25.0	4.9	4.1	6.6	3.1	3.9	2.0	1.4	3.2	3.1	
4.7	2.5	8.4	4.7	3.2	4.5	8.5	4.7	1.0	- 0	2.1	2.7	0.5	1.3	1.9	1.9	
53.6	65.5	45.0	49.0	56.5	55.0	40.6	53.9	56.5	56.6	54.9	55.1	72.7	66.9	66.2	63.6	
17.6	17.8	27.0	22.0	19.0	19.4	15.2	27.2	28.6	22.5	28.3	27.6	13.6	14.2	18.2	20.2	
15.2	43.7	24.8	17.0	22.9	24.6	50.3	7.7	3.9	10.7	6.8	6.9	31.9	11.2	5.8	10.5	
14.4	40.3	52.7	57.4	41.1	32.3	25.0	65.4	76.4	76.7	65.0	68.0	57.1	46.0	29.9	46.1	
5.5	4.2	8.5	8.0	13.1	6.6	3.6	9.6	5.1	1.9	6.0	6.1	4.0	11.2	43.1	23.9	
57.2	4.2	6.7	3.4	10.3	27.6	11.8	4.8	2.8	1.0	9.1	6.5	1.7	17.4	11.2	9.2	
3.0	3.1	2.4	7.4	5.1	3.7	2.9	3.8	4.5	1.9	6.5	5.2	1.6	7.1	2.8	3.8	
20.0	32.1	41.8	41.5	36.4	29.3	23.0	36.1	44.9	44.7	35.0	37.8	46.5	23.6	15.3	26.9	
15.2	26.7	11.5	14.2	17.8	18.1	15.6	9.6	9.0	7.8	10.0	9.5	27.6	16.2	12.7	14.3	
12.3	4.9	8.5	4.5	6.1	8.5	9.3	8.2	3.9	8.7	8.3	7.6	4.3	12.4	9.1	8.3	
8.1	4.5	7.3	2.8	7.5	6.5	6.7	3.8	0.6	1.9	4.7	3.6	1.7	8.8	10.1	7.0	
2.6	0.7	1.8	0.6	1.4	1.7	1.3	1.9	1.7	1.0	4.8	3.4	1.6	4.0	1.9	2.5	
37.2	26.7	24.2	29.5	23.4	30.8	37.7	31.7	32.6	28.2	30.6	30.9	14.6	27.9	43.8	34.3	
4.6	4.5	4.8	6.8	7.5	5.2	6.3	8.7	7.3	7.8	6.6	7.2	3.6	7.1	7.2	6.7	
7.8	6.9	9.7	5.7	5.6	7.3	5.9	7.2	9.6	10.7	8.0	8.3	5.4	4.5	5.5	6.2	
20.8	16.3	15.2	13.1	12.6	17.3	15.1	15.4	17.4	18.4	12.5	14.4	14.6	10.5	12.2	13.0	
12.8	11.4	12.1	14.8	13.1	12.6	11.8	12.0	16.9	12.6	14.3	14.1	17.2	14.3	13.4	14.2	
7.2	3.6	9.1	4.5	3.7	5.7	5.1	5.3	3.4	10.7	10.3	8.2	6.6	6.9	8.1	7.8	
14.2	20.9	13.9	15.9	20.6	16.8	14.0	16.3	19.1	11.7	13.6	14.8	13.2	14.0	16.9	15.5	
3.5	2.9	2.4	3.4	2.8	3.2	3.2	5.3	3.9	3.9	5.1	4.9	5.4	7.4	4.9	5.2	
8.4	5.1	6.1	6.8	4.2	6.6	6.4	7.7	7.9	3.9	9.0	8.1	9.0	12.1	7.8	8.5	
4.2	1.4	6.7	2.3	5.1	3.7	4.7	2.9	1.7	2.9	3.5	3.0	4.9	3.1	6.8	5.1	
12.1	10.0	6.7	7.4	12.1	10.6	12.9	13.0	7.3	9.7	9.1	9.6	8.3	6.9	8.5	8.6	
1.1	16.5	14.5	17.6	15.4	9.7	14.4	7.2	7.3	9.7	7.6	7.7	10.9	13.1	8.7	9.2	
8.0	4.9	3.6	8.5	4.7	6.4	6.3	7.7	5.6	5.8	7.0	6.8	4.5	7.1	7.3	6.8	

1/ Statistics are not presented for this group because too few records contained the specific data.

SOURCE: National Research Council, Office of Scientific and Engineering Personnel, Doctorate Records File.

APPENDIX A, TABLE 2 (Continued) 1/

Doctorates: Women

		1988 Total	Physics and Astronomy	Chemistry	Earth, Atmos. and Marine Sci.	Mathematics	Computer Sciences	Physical Sciences	Engineering	Biochemistry	Other Biosciences	Biosciences	Health Sciences	Agricultural Sciences	Life Sciences
Total Female		11790	130	429	144	121	56	880	286	203	1298	1501	543	217	2261
Female as a Percent of Total Doctorates		35.2	10.0	21.3	19.8	16.2	10.9	16.6	6.8	33.1	37.2	36.6	62.6	18.5	36.8
U.S. Citizenship	%	80.6	43.8	71.3	79.9	48.8	69.6	65.5	62.2	70.9	78.7	77.7	82.9	64.5	77.7
Non-U.S., Permanent Visa		3.8	13.1	5.4	2.8	9.1	12.5	7.0	6.3	5.9	5.2	5.3	2.8	4.6	4.6
Non-U.S., Temporary Visa		9.0	39.2	17.7	9.0	34.7	14.3	21.6	24.5	18.2	10.3	11.4	7.7	25.3	11.9
Unknown		6.6	3.8	5.6	8.3	7.4	3.6	5.9	7.0	4.9	5.7	5.6	6.6	5.5	5.8
Married	%	52.2	46.2	48.0	52.1	56.2	48.2	49.5	47.9	48.8	48.1	48.2	55.6	51.6	50.3
Not Married		39.9	49.2	45.2	37.5	37.2	46.4	43.5	44.1	45.3	45.0	45.0	37.4	41.5	42.9
Unknown		7.9	4.6	6.8	10.4	6.6	5.4	6.9	8.0	5.9	6.9	6.8	7.0	6.9	6.9
Median Age at Doct.	Yrs	35.7	30.0	29.0	32.2	30.9	33.5	30.0	29.4	29.8	31.0	30.8	37.5	32.1	32.0
Percent with Bacc in Same Field as Doctorate		50.7	79.2	81.4	44.4	73.6	19.6	70.0	64.7	27.1	62.0	57.3	60.4	47.5	57.1
Percent with Masters		80.8	63.1	36.6	73.6	79.3	87.5	55.7	80.1	31.5	51.2	48.6	88.2	88.0	61.9
Median Time Lapse From Bacc to Doct															
Total Time	Yrs	12.3	7.4	6.3	9.1	8.6	11.1	7.3	7.0	7.3	8.5	8.3	13.8	9.3	9.3
Registered Time		7.4	6.3	5.5	7.2	6.4	6.8	6.0	5.8	6.1	6.6	6.5	7.2	6.5	6.7
Postdoctoral Study Plans	%	20.2	70.0	51.7	35.4	14.0	8.9	43.9	22.0	80.3	67.3	69.1	14.7	30.4	52.3
Fellowship		11.1	26.2	21.4	19.4	5.0	1.8	18.3	7.3	50.7	44.4	45.2	7.7	9.2	32.8
Research Assoc		6.7	41.5	28.9	16.0	8.3	5.4	24.3	13.6	28.1	17.8	19.2	5.3	20.3	16.0
Traineeship		1.0	1.5	0.5	0.0	0.0	0.0	0.5	0.3	1.0	1.8	1.7	0.7	0.9	1.4
Other		1.3	0.8	0.9	0.0	0.8	1.8	0.8	0.7	0.5	3.3	2.9	0.9	0.0	2.2
Planned Employment After Doctorate	%	70.1	23.8	39.9	52.8	74.4	83.9	47.2	68.2	11.8	24.3	22.7	76.8	58.5	39.1
Educ Institution 2/		45.7	10.0	10.3	26.4	53.7	62.5	22.2	22.7	5.4	13.7	12.6	49.9	25.3	22.8
Industry/Business		9.5	10.8	25.9	11.3	13.2	16.1	19.0	35.0	4.4	5.7	5.5	7.0	11.1	6.4
Government		5.3	1.5	1.6	9.7	2.5	5.4	3.3	6.3	1.0	2.9	2.6	7.6	14.7	5.0
Nonprofit		5.4	0.0	1.2	2.1	1.7	0.0	1.1	2.1	0.5	0.5	0.5	7.9	3.2	2.6
Other & Unknown		4.2	1.5	0.9	2.8	3.3	0.0	1.6	2.1	0.5	1.5	1.4	4.4	4.1	2.4
Postdoc Status Unknown	%	9.7	6.2	8.4	11.8	11.6	7.1	9.0	9.8	7.9	8.3	8.3	8.5	11.1	8.6
Definite Postdoct Study	%	14.8	47.7	43.8	22.9	8.3	8.9	33.9	16.4	66.0	52.2	54.0	10.1	18.4	40.1
Seeking Postdoct Study		5.4	22.3	7.9	12.5	5.8	0.0	10.0	5.6	14.3	15.2	15.1	4.6	12.0	12.3
Definite Employment		49.7	13.1	27.7	36.1	49.6	67.9	32.5	40.2	9.9	14.9	14.3	56.4	39.6	26.8
Seeking Employment		20.4	10.8	12.1	16.7	24.8	16.1	14.7	28.0	2.0	9.4	8.4	20.4	18.9	12.3
Employment Activity After Doctorate Primary Activity															
R & D	%	16.7	76.5	67.2	57.7	45.0	36.8	57.3	62.6	65.0	41.8	43.9	24.5	51.2	35.1
Teaching		41.9	23.5	20.2	23.1	46.7	34.2	28.3	21.7	25.0	36.6	35.5	49.7	22.1	40.8
Administration		16.3	0.0	0.0	1.9	1.7	5.3	1.4	0.9	0.0	4.1	3.7	13.7	7.0	9.2
Prof. Services		16.8	0.0	5.9	1.9	5.0	5.3	4.5	8.7	5.0	10.8	10.3	8.2	10.5	9.2
Other		2.8	0.0	2.5	7.7	1.7	2.6	3.1	2.6	0.0	2.6	2.3	0.3	3.5	1.5
Secondary Activity															
R & D		27.7	23.5	10.1	25.0	41.7	31.6	23.1	20.9	30.0	33.5	33.2	41.8	25.6	36.5
Teaching		13.8	5.9	2.5	19.2	25.0	18.4	12.6	16.5	0.0	17.0	15.4	12.7	11.6	13.5
Administration		7.8	5.9	11.8	9.6	3.3	2.6	8.0	7.8	10.0	7.7	7.9	6.2	7.0	6.9
Prof. Services		7.4	5.9	5.0	9.6	3.3	0.0	4.9	2.6	5.0	5.2	5.1	8.2	4.7	6.6
Other		2.2	0.0	0.0	0.0	0.0	0.0	0.0	3.5	0.0	1.5	1.4	0.3	3.5	1.2
No Secondary Activity		35.6	58.8	66.4	28.8	26.7	31.6	46.2	45.2	50.0	30.9	32.7	27.1	41.9	31.2
Activity Unknown		5.5	0.0	4.2	7.7	0.0	15.8	5.2	3.5	5.0	4.1	4.2	3.6	5.8	4.1
Region of Employment After Doctorate															
New England	%	6.6	11.8	3.4	11.5	8.3	5.3	6.6	10.4	0.0	6.2	5.6	4.6	4.7	5.0
Middle Atlantic		16.5	17.6	25.2	1.9	16.7	31.6	19.6	20.9	30.0	12.9	14.5	15.0	7.0	13.7
East No Central		13.2	5.9	19.3	21.2	16.7	7.9	16.8	7.8	5.0	12.9	12.1	14.7	12.8	13.5
West No Central		5.8	5.9	5.9	1.9	5.0	2.6	4.5	5.2	5.0	7.2	7.0	5.2	5.8	5.9
South Atlantic		17.6	11.8	19.3	9.6	15.0	23.7	16.8	12.2	35.0	18.0	19.6	18.0	16.3	18.3
East So Central		4.3	0.0	0.8	0.0	1.7	0.0	0.7	2.6	0.0	4.1	3.7	4.6	2.3	4.0
West So Central		7.8	0.0	5.0	9.6	6.7	2.6	5.6	7.8	0.0	5.2	4.7	11.4	8.1	8.6
Mountain		4.8	5.9	2.5	5.8	3.3	10.5	4.5	5.2	0.0	4.6	4.2	5.2	3.5	4.5
Pacific & Insular		10.2	11.8	7.6	19.2	13.3	15.8	12.2	14.8	20.0	6.2	7.5	11.1	12.8	10.1
Foreign		4.9	11.8	2.5	9.6	11.7	0.0	5.9	8.1	5.0	13.9	13.1	5.9	20.9	10.6
Region Unknown		8.2	17.6	8.4	9.6	1.7	0.0	6.6	7.0	0.0	8.8	7.9	4.2	5.8	5.8

1/ Field groupings may differ from those in reports published by federal sponsors of the Survey of Earned Doctorates. See inside the back cover for a description of fields as reported in this table. Beginning with this report, Table 2 no longer includes an EMP subtotal. The Physical Sciences subtotal now includes Mathematics and Computer Sciences, as well as Physics/Astronomy, Chemistry, and Earth/Atmospheric/Marine Sciences. The table as displayed in past reports is available from the Doctorate Records Project office. Refer also to the explanatory note about this table in front of Appendix A.

2/ Includes 2-year, 4-year, and foreign colleges and universities, medical schools, and elementary/secondary schools.

Psychology	Economics	Anthropology and Sociology	Political Sci. & Internat'l Rel.	Other Social Sciences	Social Sciences Inc. Psychology	Total Sciences	History	Eng. and Amer. Lang. and Lit.	Foreign Lang. and Lit.	Other Humanities	Humanities	Business and Management	Other Professional Fields	Education	Total Non-Sciences	Other or Unspecified 1/
1675	167	407	109	238	2596	6023	217	401	248	708	1574	247	425	3507	5753	14
54.8	19.6	52.6	23.3	38.6	45.0	28.1	86.0	56.0	57.7	39.2	44.3	23.8	40.4	55.2	48.0	27.5
87.3	63.5	77.6	76.1	75.6	82.7	77.3	87.6	85.0	65.7	79.5	79.9	76.9	80.2	87.0	84.1	
2.0	7.2	4.9	1.8	3.8	2.9	4.3	2.8	4.2	16.5	4.1	5.9	5.7	2.6	2.1	3.3	
2.1	24.6	10.8	12.8	13.4	6.4	11.5	4.6	5.5	12.1	10.2	8.5	8.1	7.8	4.9	6.3	
8.6	4.8	6.6	9.2	7.1	7.9	6.8	5.1	5.2	5.6	6.2	5.7	9.3	9.4	6.0	6.3	
46.8	50.3	52.6	44.0	52.1	48.3	49.2	50.2	54.9	55.2	46.6	50.6	55.9	44.7	58.7	55.3	
43.5	43.1	40.5	44.0	39.5	42.6	42.9	43.3	39.2	37.5	45.3	42.2	32.8	43.5	33.8	36.8	
9.7	6.6	6.9	11.9	8.4	9.1	7.9	6.5	6.0	7.3	8.1	7.2	11.3	11.8	7.5	7.9	
34.0	31.3	37.1	33.9	37.8	34.6	32.3	35.9	36.6	35.3	35.5	35.7	34.6	39.2	41.0	39.3	
58.3	67.7	49.9	45.9	12.6	52.9	57.5	53.9	68.1	63.7	49.6	57.1	36.4	23.8	40.5	43.6	
77.5	73.7	89.4	89.0	86.6	80.4	69.8	88.0	91.5	91.5	87.0	89.0	85.0	94.8	94.2	92.4	
10.3	8.5	13.1	11.3	13.6	10.9	9.4	12.8	13.3	12.2	12.3	12.6	11.0	15.8	17.2	15.7	
7.2	6.3	9.2	7.8	7.9	7.5	6.8	9.4	8.4	8.6	8.7	8.7	6.9	7.7	8.0	8.1	
19.3	3.6	14.7	11.0	14.3	16.8	34.3	8.8	3.7	7.7	10.2	7.9	0.8	5.4	4.6	5.4	
11.0	1.2	9.1	6.4	8.0	9.6	19.5	5.5	1.5	4.4	4.9	4.1	0.4	1.6	1.9	2.4	
4.3	1.8	3.2	3.7	5.0	4.0	11.9	1.8	0.7	2.0	2.3	1.8	0.0	1.6	1.1	1.3	
2.4	0.6	1.2	0.0	0.8	1.8	1.4	0.0	0.0	0.4	0.7	0.4	0.4	1.2	0.6	0.6	
1.7	0.0	1.2	0.9	0.4	1.3	1.5	1.4	1.5	0.8	2.3	1.7	0.0	0.9	1.0	1.1	
70.1	87.4	74.9	78.0	73.5	72.6	56.1	81.6	87.0	83.1	79.9	82.5	87.4	82.8	85.9	84.8	
25.1	65.3	48.6	62.4	36.6	34.0	27.5	60.8	75.1	71.8	60.6	66.1	79.8	56.5	64.0	64.7	
15.6	4.8	7.4	6.4	11.3	12.8	12.4	5.1	5.5	2.8	7.9	6.1	4.9	7.8	6.7	6.5	
7.1	10.2	3.7	2.8	7.6	6.6	5.5	4.1	0.0	2.0	2.0	1.8	0.8	5.6	6.7	5.0	
16.1	1.8	9.1	0.9	8.8	12.8	6.7	6.9	1.0	0.8	4.9	3.6	0.0	7.8	4.1	4.1	
6.3	5.4	6.1	5.5	9.2	6.4	4.0	4.6	5.5	5.6	4.5	5.0	2.0	1.7	4.4	4.5	
10.6	9.0	10.3	11.0	12.2	10.6	9.6	9.7	9.2	9.3	9.9	9.6	11.7	11.6	9.6	9.8	
14.7	3.0	8.4	6.4	8.8	12.1	26.0	4.6	2.0	4.4	5.2	4.2	0.8	2.4	2.8	3.1	
4.7	0.6	6.4	4.6	5.5	4.7	8.4	4.1	1.7	3.2	4.9	3.7	0.0	3.1	1.8	2.3	
49.6	71.9	46.4	58.7	45.4	50.5	38.5	54.8	54.9	53.2	52.1	53.4	76.9	65.2	63.6	61.5	
20.5	15.6	28.5	19.3	28.2	22.1	17.6	26.7	32.2	29.8	27.8	29.1	10.5	17.6	22.3	23.3	
13.4	39.2	32.8	21.9	27.8	20.1	30.8	5.9	3.2	7.6	7.9	6.3	32.1	13.0	5.3	7.6	
15.1	50.8	43.9	67.2	29.6	26.2	30.1	65.5	77.3	79.5	70.5	73.0	59.5	47.7	40.2	49.6	
5.4	0.0	9.5	1.6	10.2	5.7	5.9	6.7	6.4	2.3	4.3	4.9	2.6	15.9	32.6	23.1	
61.1	4.2	6.3	0.0	17.6	41.4	26.8	6.7	3.2	0.8	7.0	5.0	1.6	15.5	12.4	10.3	
2.4	3.3	3.7	3.1	7.4	3.1	2.7	8.4	3.6	3.8	5.7	5.2	1.1	2.2	2.2	2.9	
23.9	42.5	34.9	46.9	25.9	28.5	29.5	40.3	37.7	53.8	40.4	41.8	47.9	33.2	18.1	26.5	
16.9	20.0	17.5	12.5	15.7	16.9	15.5	6.7	9.1	3.0	8.7	7.6	28.4	18.1	12.6	12.7	
7.1	7.5	7.4	6.3	7.4	7.2	7.2	6.7	3.6	3.0	5.1	4.6	2.1	7.6	10.1	8.2	
7.6	3.3	5.3	4.7	5.6	6.6	6.2	0.8	1.4	0.8	4.6	2.6	2.1	7.9	10.8	8.2	
3.6	1.7	5.2	3.1	0.0	3.1	2.2	0.8	4.5	0.8	6.2	4.2	1.1	2.9	1.6	2.3	
38.3	22.5	28.0	20.3	38.0	34.5	35.6	37.8	37.3	32.6	30.4	33.6	15.3	24.5	39.6	35.7	
2.7	2.5	3.7	6.3	7.4	3.4	3.8	6.7	6.4	6.1	4.6	5.6	3.2	5.8	7.3	6.5	
7.5	12.5	6.9	14.1	6.5	8.1	7.2	6.7	7.3	12.1	8.7	8.6	8.4	6.9	5.1	6.2	
21.6	15.8	19.0	12.5	14.8	19.7	18.2	16.8	24.1	15.2	13.6	17.0	12.1	16.2	15.1	15.5	
13.3	11.7	13.2	15.6	8.3	12.8	13.2	15.1	15.0	19.7	13.0	14.9	12.1	13.4	12.6	13.1	
5.8	4.2	4.2	3.1	4.6	5.2	5.3	3.4	3.6	7.6	6.0	5.2	5.8	7.9	6.2	6.1	
14.3	26.7	13.8	21.9	23.1	16.5	16.8	19.3	16.8	14.4	13.8	15.5	19.5	15.5	19.5	18.2	
3.7	0.0	2.6	1.6	3.7	3.1	3.0	2.5	5.9	5.3	2.7	3.9	5.8	6.9	5.3	5.1	
6.7	5.0	5.3	9.4	2.8	6.2	6.8	8.4	4.1	6.1	9.5	7.4	8.4	12.6	8.3	8.5	
4.8	7.7	6.3	7.8	3.7	4.8	4.7	5.9	4.1	3.0	4.1	4.2	5.3	1.0	5.5	4.9	
11.2	5.0	15.3	4.7	9.3	10.8	11.0	12.6	8.2	8.3	13.3	11.1	12.6	8.3	9.2	9.8	
1.3	12.5	5.3	6.3	13.0	4.1	6.1	3.4	4.5	3.8	7.0	5.4	6.3	4.0	3.4	4.1	
9.8	5.0	7.9	3.1	10.2	8.8	7.6	5.9	6.4	4.5	8.4	6.9	3.7	6.5	10.0	8.6	

1/ Statistics are not presented for this group because too few records contained the specific data.

SOURCE: National Research Council, Office of Scientific and Engineering Personnel, Doctorate Records File.

APPENDIX A, TABLE 3 Sources of Support in Graduate School of Doctorate Recipients, by Sex and Summary Field, 1988 [1/]

Sources of Support in Graduate School		Total		Physical Sciences		Engineering		Life Sciences		Social Sciences		Humanities		Prof./Other Fields		Education	
		Men/Women		Men/Women		Men/Women		Men/Women		Men/Women		Men/Women		Men/Women		Men/Women	
NSF Research Assistant	N	1478	335	782	165	437	35	162	75	75	47	5	3	8	0	9	10
	V%[2/]	7.5	3.1	19.3	20.4	12.4	13.5	4.6	3.6	2.7	2.0	0.3	0.2	0.6	0.0	0.3	0.3
	H%	100.0	100.0	52.9	49.3	29.6	10.4	11.0	22.4	5.1	14.0	0.3	0.9	0.5	0.0	0.6	3.0
NIH Research Assistant	N	778	397	211	54	50	6	458	265	52	62	1	4	2	1	3	5
	V	4.0	3.7	5.2	6.7	1.4	2.3	12.9	12.7	1.9	2.7	0.1	0.3	0.2	0.2	0.1	0.2
	H	100.0	100.0	27.1	13.6	6.4	1.5	58.9	66.8	6.7	15.6	0.1	1.0	0.3	0.3	0.4	1.3
Other Federal Research Assistant	N	1030	325	405	67	321	22	209	118	58	65	5	9	8	9	24	35
	V	5.3	3.0	10.0	8.3	9.1	8.5	5.9	5.6	2.1	2.8	0.3	0.6	0.6	1.5	0.9	1.1
	H	100.0	100.0	39.3	20.6	31.2	6.8	20.3	36.3	5.6	20.0	0.5	2.8	0.8	2.8	2.3	10.8
NSF Fellowship	N	261	120	83	18	46	8	75	46	44	33	3	5	2	0.0	8	10
	V	1.3	1.1	2.0	2.2	1.3	3.1	2.1	2.2	1.6	1.4	0.2	0.3	0.2	0.0	0.3	0.3
	H	100.0	100.0	31.8	15.0	17.6	6.7	28.7	38.3	16.9	27.5	1.1	4.2	0.8	0.0	3.1	8.3
NIH Traineeship	N	690	664	26	07	25	8	509	448	116	166	2	2	7	9	4	24
	V	3.5	6.2	0.6	0.9	0.7	3.1	14.3	21.4	4.1	7.1	0.1	0.1	0.6	1.5	0.2	0.7
	H	100.0	100.0	3.8	1.1	3.6	1.2	73.8	67.5	16.8	25.0	0.3	0.3	1.0	1.4	0.6	3.6
Other Department of Health & Human Services	N	71	127	2	2	4	2	26	61	30	39	2	1	3	7	4	15
	V	0.4	1.2	0.0	0.2	0.1	0.8	0.7	2.9	1.1	1.7	0.1	0.1	0.2	1.2	0.2	0.5
	H	100.0	100.0	2.8	1.6	5.6	1.6	36.6	48.0	42.3	30.7	2.8	0.8	4.2	5.5	5.6	11.8
Department of Education	N	313	276	40	16	33	7	37	40	75	75	75	63	9	9	43	65
	V	1.6	2.6	1.0	2.0	0.9	2.7	1.0	1.9	2.7	3.2	4.2	4.4	0.7	1.5	1.7	2.0
	H	100.0	100.0	12.8	5.8	10.5	2.5	11.8	14.5	24.0	27.2	24.0	22.8	2.9	3.3	13.7	23.6
GI Bill	N	519	56	46	2	45	2	51	13	106	15	61	6	68	2	142	16
	V	2.7	0.5	1.1	0.2	1.3	0.8	1.5	0.6	3.8	0.6	3.4	0.4	5.5	0.3	5.5	0.5
	H	100.0	100.0	8.9	3.6	8.7	3.6	9.8	23.2	20.4	26.6	11.8	10.7	13.1	3.6	27.4	28.6
Other Federal Support	N	628	286	133	26	151	10	117	69	88	69	65	44	25	15	48	53
	V	3.2	2.7	3.3	3.2	4.3	3.9	3.3	3.3	3.1	3.0	3.7	3.0	2.0	2.5	1.9	1.6
	H	100.0	100.0	21.2	9.1	24.0	3.5	18.6	24.1	14.0	24.1	10.4	15.4	4.0	5.2	7.6	18.5
Foreign Government	N	1263	243	219	27	348	8	301	63	136	43	62	46	76	6	118	50
	V	6.5	2.3	5.4	3.3	9.8	3.1	8.5	3.0	4.9	1.8	3.5	3.2	6.1	1.0	4.6	1.6
	H	100.0	100.0	17.3	11.1	27.6	3.3	23.8	25.9	10.8	17.7	4.9	18.9	6.0	2.5	9.3	20.6
National Fellowship (non-federal)	N	790	590	147	51	146	37	122	92	157	143	143	157	41	36	34	73
	V	4.0	5.5	3.6	6.3	4.1	14.3	3.4	4.4	5.6	6.1	8.1	10.9	3.3	6.1	1.3	2.3
	H	100.0	100.0	18.6	8.6	18.5	6.3	15.4	15.6	19.9	24.2	18.1	26.6	5.2	6.1	4.3	12.4
Univ. Teaching Assistant	N	10185	4970	2993	619	1645	139	1400	832	1650	1230	1270	1035	646	309	570	802
	V	52.0	46.2	73.8	76.5	46.5	53.7	39.4	39.7	58.9	52.8	71.5	71.5	52.0	52.0	22.0	24.9
	H	100.0	100.0	29.4	12.5	16.2	2.8	13.7	16.7	16.2	24.7	12.5	20.8	6.3	6.2	5.6	16.1
Univ. Research Assistant	N	8429	3249	2298	449	2220	161	1735	869	1068	860	283	223	425	174	388	510
	V	43.1	30.2	56.7	55.5	62.8	62.2	48.8	41.5	38.2	36.9	15.9	15.4	34.2	29.3	15.0	15.8
	H	100.0	100.0	27.3	13.8	26.3	5.0	20.6	26.7	12.7	26.5	3.4	6.9	5.0	5.4	4.6	15.7
University Fellowship	N	3765	2187	793	158	560	52	637	436	676	563	669	535	229	123	195	298
	V	19.2	20.3	19.6	19.5	15.8	20.1	17.9	20.8	24.2	24.2	37.7	38.4	18.4	20.7	7.5	9.2
	H	100.0	100.0	21.1	7.2	14.9	2.4	16.9	19.9	18.0	25.7	17.8	25.4	6.1	5.6	5.2	13.6
Other University-Related	N	1419	1311	157	44	124	20	261	201	336	342	201	216	85	75	254	411
	V	7.2	12.2	3.9	5.4	3.5	7.7	7.3	9.6	12.0	14.7	11.3	14.9	6.8	12.6	9.8	12.7
	H	100.0	100.0	11.1	3.4	8.7	1.5	18.4	15.3	23.7	26.1	14.2	16.5	6.0	5.7	17.9	31.4
Business/Employer Funds	N	1052	575	168	28	282	19	103	94	97	77	45	27	96	38	260	290
	V	5.4	5.3	4.1	3.5	8.0	7.3	2.9	4.5	3.5	3.3	2.5	1.9	7.7	6.4	10.0	9.0
	H	100.0	100.0	16.0	4.9	26.8	3.3	9.8	16.3	9.2	13.4	4.3	4.7	9.1	6.6	24.7	50.4
Own Earnings	N	10044	6880	1143	196	1194	92	1350	892	1940	1602	1291	980	857	421	2251	2693
	V	51.3	63.9	28.2	24.2	33.8	35.5	38.0	42.6	69.3	68.7	72.7	67.7	69.0	70.9	86.8	83.5
	H	100.0	100.0	11.4	2.8	11.9	1.3	13.4	13.0	19.3	23.3	12.9	14.2	8.5	6.1	22.4	39.1
Spouse's Earnings	N	4276	3143	619	126	471	39	822	522	783	794	559	457	363	194	656	1006
	V	21.8	29.2	15.3	15.6	13.3	15.1	23.1	24.9	28.0	34.1	31.5	31.6	29.2	32.7	25.3	31.2
	H	100.0	100.0	14.5	4.0	11.0	1.2	19.2	16.6	18.3	25.3	13.1	14.5	8.5	6.2	15.3	32.0
Family Support	N	4598	2438	822	151	846	39	839	484	858	706	523	414	324	125	382	513
	V	23.5	22.6	20.3	18.7	23.9	15.1	23.6	23.1	30.7	30.3	29.5	28.6	26.1	21.0	14.7	15.9
	H	100.0	100.0	17.9	6.2	18.4	1.6	18.2	19.9	18.7	29.0	11.4	17.0	7.0	5.1	8.3	21.0
Guaranteed Student Loans	N	4403	3109	619	136	357	49	860	538	1126	1004	584	425	298	192	555	761
	V	22.5	28.9	15.3	16.8	10.1	18.9	24.2	25.7	40.2	43.1	32.9	29.4	24.0	32.3	21.4	23.6
	H	100.0	100.0	14.1	4.4	8.1	1.6	19.5	17.3	25.6	32.3	13.3	13.7	6.8	6.2	12.6	24.5
National Direct Student Loans	N	808	652	55	15	38	5	109	77	286	273	175	127	49	29	96	125
	V	4.1	6.1	1.4	1.9	1.1	1.9	3.1	3.7	10.2	11.7	9.9	8.8	3.9	4.9	3.7	3.9
	H	100.0	100.0	6.8	2.3	4.7	0.8	13.5	11.8	35.4	41.9	21.7	19.5	6.1	4.4	11.9	19.2
Other Loans	N	515	403	65	23	60	10	68	41	118	119	64	55	50	34	89	120
	V	2.6	3.7	1.6	2.8	1.7	3.9	1.9	2.0	4.2	5.1	3.6	3.8	4.0	5.7	3.4	3.7
	H	100.0	100.0	12.6	5.7	11.7	2.5	13.2	10.2	22.9	29.5	12.4	13.6	9.7	8.4	17.3	29.8
Other Sources	N	582	400	91	20	70	12	99	94	94	74	86	53	64	37	78	109
	V	3.0	3.7	2.2	2.5	2.0	4.6	2.8	4.5	3.4	3.2	4.8	3.7	5.2	6.2	3.0	3.4
	H	100.0	100.0	15.6	5.0	12.0	3.0	17.0	23.5	16.2	18.5	14.8	13.3	11.0	9.3	13.4	27.3
Unduplicated Total[3/]	N	19578	10769	4056	809	3534	259	3554	2094	2799	2331	1775	1447	1242	594	2592	3224

1/ Field groupings may differ from those in reports published by federal sponsors of the Survey of Earned Doctorates. See inside the back cover for a description of fields as reported in this table. Refer also to the explanatory note about this table in front of Appendix A.
2/ V% denotes vertical percentage; H denotes horizontal percentage.
3/ The 5,109 Ph.D.s who did not report sources of support are omitted from this table.

SOURCE: National Research Council, Office of Scientific and Engineering Personnel, Doctorate Records File.

APPENDIX A, TABLE 4 State of Doctoral Institution of Doctorate Recipients, by Sex and Summary Field, 1988 [1/]

	Total		Field of Doctorate: Physical Sciences		Engineering		Life Sciences		Social Sciences		Humanities		Prof./Other Fields		Education	
	Men/Women		Men/Women		Men/Women		Men/Women		Men/Women		Men/Women		Men/Women		Men/Women	
U.S. Total [2/]	21666	11790	4429	880	3904	286	3882	2261	3173	2596	1979	1574	1420	672	2842	3507
Alabama	162	123	17	1	33	4	36	35	21	14	7	7	11	3	37	59
Alaska	11	3	8	2	0	0	3	1	0	0	0	0	0	0	0	0
Arizona	320	176	91	15	52	2	60	30	45	31	20	20	17	9	35	69
Arkansas	68	33	15	1	8	0	12	4	5	1	2	7	12	2	14	18
California	2727	1324	658	123	576	50	436	235	462	386	255	215	154	55	184	258
Colorado	413	201	115	15	75	3	66	45	49	50	31	15	13	13	64	60
Connecticut	310	175	80	12	34	1	72	49	50	29	54	53	7	7	13	24
Delaware	73	36	15	6	35	3	7	2	4	11	9	8	0	0	3	6
D. C.	303	222	32	5	39	0	36	35	82	52	51	45	34	31	29	54
Florida	635	450	100	26	95	7	89	44	85	74	34	32	63	19	167	248
Georgia	398	293	46	13	53	6	82	41	63	54	31	39	40	11	83	129
Hawaii	72	39	15	3	3	0	28	12	12	8	7	4	0	0	7	12
Idaho	46	16	8	0	7	0	18	5	1	1	1	3	1	0	10	7
Illinois	1289	634	259	41	248	21	195	127	195	131	168	87	70	37	151	189
Indiana	629	268	126	24	120	10	105	49	84	58	73	57	38	11	81	59
Iowa	446	202	89	15	89	6	109	46	34	39	38	31	18	4	68	60
Kansas	227	149	26	9	28	1	61	34	41	24	18	15	10	5	43	61
Kentucky	165	83	20	4	11	0	40	15	18	24	22	9	38	7	16	24
Louisiana	244	96	47	9	30	1	61	19	26	17	29	12	33	9	18	29
Maine	18	7	7	0	1	0	3	4	2	2	2	0	0	0	3	1
Maryland	397	301	86	22	62	4	99	99	52	51	45	34	16	13	36	75
Massachusetts	1212	644	285	72	270	29	145	125	215	124	92	82	56	33	147	178
Michigan	814	388	126	34	152	4	163	78	110	95	77	52	52	23	130	101
Minnesota	351	174	62	8	58	5	117	39	41	37	28	27	15	18	30	40
Mississippi	156	88	15	2	6	0	42	14	25	19	6	4	16	6	46	43
Missouri	354	191	45	14	62	4	63	35	66	53	29	16	36	9	52	60
Montana	48	16	10	3	4	0	13	1	4	5	0	0	0	0	17	7
Nebraska	159	89	22	4	8	1	52	11	18	24	6	10	21	7	31	32
Nevada	20	13	6	2	0	0	6	0	1	2	1	0	0	0	6	9
New Hampshire	39	21	13	7	7	1	12	4	6	4	1	2	0	0	0	3
New Jersey	458	251	129	16	72	8	76	43	68	41	62	56	21	10	30	77
New Mexico	128	80	36	8	36	2	14	11	11	17	12	9	0	0	19	33
New York	2074	1397	408	82	351	25	326	260	399	408	256	229	126	90	205	302
North Carolina	510	278	107	28	84	9	130	96	60	50	48	24	13	5	67	66
North Dakota	45	19	11	3	4	0	23	8	4	4	2	0	0	0	1	4
Ohio	814	462	184	33	157	10	111	64	101	100	66	60	67	48	124	146
Oklahoma	218	128	24	7	52	3	51	12	25	26	14	14	15	15	37	51
Oregon	251	119	58	10	31	3	59	16	30	21	7	11	6	2	60	56
Pennsylvania	1123	652	201	43	252	22	128	103	162	137	84	89	89	28	203	230
Rhode Island	160	77	66	18	27	3	17	6	25	21	25	29	0	0	0	0
South Carolina	173	101	49	17	18	1	37	21	19	17	11	10	15	11	24	24
South Dakota	38	10	2	0	6	0	6	0	7	0	0	0	0	0	17	10
Tennessee	328	174	43	3	39	2	47	21	54	43	33	19	32	11	79	75
Texas	1353	711	248	37	233	18	241	181	155	104	103	62	163	66	210	242
Utah	304	109	70	9	51	0	51	17	50	25	11	10	13	6	57	42
Vermont	28	15	9	1	5	0	8	2	6	8	0	1	0	0	0	3
Virginia	460	235	86	19	121	9	82	36	53	54	27	13	35	15	56	88
Washington	388	188	81	17	63	0	116	52	49	45	26	18	20	14	33	42
West Virginia	89	48	7	3	18	0	15	8	13	4	2	1	0	0	34	32
Wisconsin	555	243	141	31	112	8	102	62	60	40	49	31	34	12	53	51
Wyoming	48	22	19	1	6	0	9	4	3	4	0	0	0	0	11	13
Puerto Rico	15	16	6	2	0	0	2	0	2	7	4	2	0	0	1	5

1/ Field groupings may differ from those in reports published by federal sponsors of the Survey of Earned Doctorates. See inside the back cover for a description of fields as reported in this table. Refer also to the explanatory note about this table in front of Appendix A.
2/ Includes the 50 states, the District of Columbia, and Puerto Rico.

SOURCE: National Research Council, Office of Scientific and Engineering Personnel, Doctorate Records File.

APPENDIX A, TABLE 5 Statistical Profile of Doctorate Recipients, by Racial/Ethnic Group and Citizenship Status, 1988[1/]

		Total				American Indian	Asian				Black			
		U.S.	Non-U.S. Perm.	Non-U.S. Temp.	Total	Total	U.S.	Non-U.S. Perm.	Non-U.S. Temp.	Total	U.S.	Non-U.S. Perm.	Non-U.S. Temp.	Total
Total Number		23172	1611	6176	33456[2/]	93	612	621	3510	4771[2/]	805	146	289	1246[2/]
Male	%	59.0	71.9	82.9	64.8	54.8	67.5	73.6	84.0	80.4	38.6	82.9	86.2	55.1
Female		41.0	28.1	17.1	35.2	45.2	32.5	26.4	16.0	19.6	61.4	17.1	13.8	44.9
Doctoral Field														
Physical Sciences	%	13.9	15.6	23.9	15.9	11.8	18.1	19.0	26.3	24.3	4.0	6.2	9.3	5.5
Engineering		7.7	22.7	27.9	12.5	4.3	23.0	30.8	32.1	30.6	2.4	8.2	12.5	5.4
Life Sciences		18.9	18.9	17.2	18.4	19.4	20.8	16.9	15.0	16.0	8.8	21.9	26.0	14.4
Social Sciences		18.6	13.7	11.4	17.2	12.9	13.9	9.3	9.6	10.1	19.6	25.3	18.7	20.1
Humanities		12.0	10.4	5.6	10.6	7.5	6.0	5.2	3.6	4.1	9.6	7.5	7.3	8.8
Education		22.8	10.6	7.8	19.0	37.6	13.4	7.7	6.5	7.5	46.0	26.0	20.4	37.6
Professional/Other		6.1	8.1	6.2	6.4	6.5	4.7	11.1	7.0	7.2	9.7	4.8	5.9	8.2
Median Age at Doct.	Yrs	34.2	33.6	32.6	33.8	37.2	33.2	33.2	32.5	32.7	38.5	36.6	35.8	37.5
Median Time Lapse BA-PhD														
Total Time	Yrs	11.0	10.0	9.3	10.5	13.3	9.9	10.3	9.4	9.6	14.9	9.9	10.2	12.8
Registered Time		7.2	7.0	6.2	6.9	7.7	7.0	7.0	6.2	6.4	8.1	7.0	6.2	7.4
Graduate School Support														
Federal Fellow/Trainee	%	12.6	4.7	4.2	9.8	17.2	14.7	3.5	2.8	4.4	17.6	6.8	10.0	14.6
Federal Research Asst.		12.0	13.0	15.4	11.8	9.7	19.0	17.6	18.2	18.2	5.3	6.2	5.9	5.6
GI Bill		2.5	0.0	0.0	1.7	2.2	0.7	0.0	0.0	0.1	3.0	0.0	0.0	1.9
Foreign Government		0.4	7.8	20.7	4.5	1.1	0.5	4.7	13.7	10.8	0.2	8.9	32.5	8.7
National Fellowship		4.6	3.6	4.0	4.1	7.5	5.1	2.7	3.0	3.2	8.2	5.5	6.9	7.6
Univ. Teaching Assistant		47.9	53.1	51.3	45.3	39.8	45.8	54.4	54.0	53.0	29.3	37.0	37.4	32.3
Univ. Research Assistant		33.8	46.1	49.9	34.9	28.0	39.1	53.8	56.1	53.5	20.7	34.2	35.6	25.9
Other University		27.6	23.6	21.0	24.2	22.6	22.5	20.0	19.5	19.9	33.3	33.6	24.6	31.2
Business/Employer		6.3	3.0	2.0	4.9	4.3	6.2	2.9	1.6	2.4	7.6	2.1	3.1	5.9
Self/Family Sources		78.0	68.3	51.7	66.9	82.8	65.5	61.2	50.5	53.7	83.0	80.1	59.5	76.9
Guaranteed Student Loan		31.0	16.9	0.8	22.5	32.3	27.3	13.7	0.4	5.6	34.5	38.4	2.1	27.4
Other Loans		8.7	5.9	2.2	6.7	10.8	6.5	4.0	0.9	2.1	14.2	12.3	4.2	11.6
Other		3.0	2.9	3.7	2.9	8.6	2.8	2.4	2.4	2.4	3.0	4.8	5.5	3.9
Unknown		2.0	2.9	2.8	9.3	1.1	2.3	2.1	1.9	2.0	2.1	4.8	3.8	3.0
Postdoctoral Plans														
Postdoctoral Study	%	22.9	25.1	34.3	23.5	17.2	29.2	24.8	37.7	35.0	12.9	18.5	31.1	17.9
Planned Employment		74.6	68.5	59.7	66.1	78.5	65.7	67.6	56.1	58.8	84.3	74.7	63.3	78.0
Educ. Institution		44.0	36.8	37.3	39.2	50.5	24.3	29.5	34.6	32.6	58.8	43.2	45.3	53.6
Industry/Business		14.6	20.3	11.6	13.2	10.8	25.8	29.6	13.1	16.8	7.6	8.2	3.5	6.7
Government		7.2	3.3	5.8	6.2	10.8	8.2	2.3	4.5	4.7	9.6	9.6	6.2	8.7
Non-profit		5.5	3.4	1.7	4.3	4.3	3.3	3.1	1.6	2.0	4.2	4.8	3.1	4.0
Other & Unknown		3.3	4.7	3.3	3.1	2.2	4.1	3.2	2.3	2.6	4.2	8.9	5.2	5.0
Postdoc Status Unknown	%	2.6	6.5	6.0	10.5	4.3	5.1	7.6	6.1	6.3	2.7	6.8	5.5	4.1
Definite Postdoct Study	%	17.9	15.6	22.1	17.3	11.8	19.6	17.1	24.9	23.2	8.6	5.5	14.5	9.6
Seeking Postdoct Study		5.0	9.5	12.3	6.2	5.4	9.6	7.7	12.8	11.8	4.3	13.0	16.6	8.3
Definite Employment		55.8	40.0	40.4	48.1	54.8	45.8	41.4	36.3	38.0	63.2	28.1	40.1	53.5
Seeking Employment		18.7	28.4	19.3	17.9	23.7	19.9	26.2	19.9	20.8	21.1	46.6	23.2	24.6
Employment Location after Doctorate														
U.S.	% [3/]	92.4	79.4	37.1	83.2	82.4	88.6	80.2	41.4	54.2	89.6	65.9	14.7	75.1
Foreign		1.1	13.0	53.0	9.7	5.9	1.4	12.8	46.9	35.0	0.4	22.0	70.7	14.0
Unreported		6.5	7.6	10.0	7.1	11.8	10.0	7.0	11.7	10.8	10.0	12.2	14.7	11.0

1/ Field groupings may differ from those in reports published by federal sponsors of the Survey of Earned Doctorates. See inside the back cover for a description of fields as reported in this table. Refer also to the explanatory note about this table in front of Appendix A for a discussion of past changes in the survey question on racial/ethnic group.
2/ Includes individuals who did not report their citizenship at time of doctorate.
3/ The base for this percentage is the number of doctorates in the column caption group who have found definite employment.

White				Puerto Rican	Mexican-American				Other Hispanic				Other & Unknown		
U.S.	Non-U.S. Perm.	Non-U.S. Temp.	Total	Total	U.S.	Non-U.S. Perm.	Non-U.S. Temp.	Total	U.S.	Non-U.S. Perm.	Non-U.S. Temp.	Total	U.S.	Non-U.S.	Total
20685	668	1676	23053[2/]	176	176	14	28	219[2/]	243	84	318	650[2/]	383	432	3248[2/]
59.4	67.1	78.9	61.1	51.1	58.0	78.6	92.9	63.9	53.5	63.1	82.1	68.9	71.8	87.7	71.8
40.6	32.9	21.1	38.9	48.9	42.0	21.4	7.1	36.1	46.5	36.9	17.9	31.1	28.2	12.3	28.2
14.1	15.0	22.3	14.7	13.6	8.5	7.1	10.7	8.7	12.8	6.0	22.6	16.9	23.5	22.5	16.2
7.4	18.6	24.6	9.0	7.4	4.5	21.4	21.4	8.2	9.1	20.2	17.3	14.5	11.5	25.0	14.3
19.4	19.0	16.4	19.2	14.8	8.0	42.9	50.0	15.5	18.1	22.6	32.4	25.7	16.7	19.7	16.3
18.7	14.5	13.7	18.2	19.3	26.1	7.1	7.1	22.4	21.8	16.7	11.6	16.2	16.4	14.1	19.7
12.2	15.7	9.1	12.1	14.8	12.5	7.1	0.0	10.5	18.9	20.2	8.2	13.7	11.5	4.6	9.5
22.1	10.6	8.4	20.8	25.6	35.8	0.0	10.7	30.1	18.1	8.3	5.7	10.6	16.2	8.6	15.9
6.1	6.6	5.5	6.1	4.5	4.5	14.3	0.0	4.6	1.2	6.0	2.2	2.5	4.2	5.6	8.0
34.1	33.4	31.9	33.8	35.1	36.5	32.5	34.3	35.7	33.4	34.2	34.3	34.0	33.3	33.3	33.5
10.9	9.6	8.5	10.7	11.9	11.8	9.0	9.5	11.1	10.1	10.9	10.2	10.3	9.9	9.6	10.1
7.2	6.9	6.2	7.1	7.5	7.7	6.3	6.0	7.3	7.2	7.2	5.7	6.3	7.2	6.2	6.6
12.0	4.9	6.0	11.3	25.6	29.0	7.1	7.1	25.1	31.4	7.1	4.7	11.4	12.0	4.4	2.1
12.1	10.0	12.6	12.1	9.7	9.7	7.1	14.3	10.0	10.7	11.9	11.9	11.8	13.8	13.4	3.4
2.5	0.0	0.1	2.3	1.7	2.3	0.0	0.0	2.3	2.1	0.0	0.0	0.8	2.1	0.0	0.2
0.4	8.4	27.3	2.6	1.7	0.0	21.4	53.6	8.2	0.8	13.1	39.3	21.7	0.0	27.3	3.8
4.3	3.9	5.1	4.4	8.5	11.9	7.1	0.0	10.0	9.9	3.6	6.9	7.7	5.0	3.7	1.1
48.8	57.8	51.4	49.3	39.8	44.9	28.6	35.7	42.5	46.9	50.0	43.4	45.5	46.0	42.8	11.4
34.3	44.5	43.8	35.3	21.0	23.9	42.9	50.0	28.3	30.5	31.0	40.9	35.8	37.3	36.8	9.6
27.4	24.7	23.6	27.0	34.1	34.7	35.7	17.9	32.4	33.3	31.0	20.8	26.9	24.5	19.7	5.7
6.2	3.3	2.6	5.9	8.5	5.7	0.0	0.0	4.6	7.0	4.8	4.4	5.4	5.5	0.9	0.8
78.5	73.2	55.8	76.6	69.9	80.7	57.1	46.4	74.4	74.5	73.8	52.5	63.4	63.2	41.4	13.2
30.8	15.7	1.3	28.2	44.9	35.2	7.1	0.0	28.8	38.3	20.2	0.3	17.2	27.7	2.3	3.6
8.4	5.7	3.8	8.0	11.4	15.3	7.1	3.6	13.2	11.9	11.9	5.7	8.8	9.7	2.5	1.5
3.0	2.8	5.3	3.2	2.3	6.3	7.1	7.1	6.4	2.1	3.6	8.2	5.2	2.6	3.5	0.8
1.8	3.0	3.1	2.0	4.0	2.3	7.1	0.0	2.3	1.2	2.4	2.5	2.0	12.3	8.8	77.0
23.0	26.2	29.7	23.6	24.4	21.0	21.4	42.9	23.7	23.5	25.0	29.9	26.8	27.7	28.7	7.3
74.7	69.8	65.7	73.9	72.7	77.3	50.0	57.1	73.1	75.3	69.0	65.1	69.5	60.6	58.3	15.2
44.1	41.9	42.2	43.9	40.9	54.0	28.6	32.1	49.8	44.0	41.7	35.2	39.2	30.3	36.8	8.7
14.6	15.9	10.7	14.4	11.9	4.5	21.4	7.1	5.9	14.8	16.7	10.4	13.1	16.2	9.3	3.1
7.1	2.4	7.3	6.9	6.8	11.4	0.0	17.9	11.4	7.4	4.8	12.3	9.5	4.2	5.1	1.2
5.7	4.2	1.8	5.5	6.8	4.0	0.0	0.0	3.2	4.9	1.2	1.6	2.8	5.0	0.9	0.7
3.2	5.4	3.7	3.3	6.3	3.4	0.0	0.0	2.7	4.1	4.8	5.7	4.9	5.0	6.3	1.5
2.3	4.0	4.6	2.6	2.8	1.7	28.6	0.0	5.2	1.2	6.0	5.0	3.7	11.7	13.0	77.6
18.2	16.0	18.7	18.1	19.3	17.0	14.3	25.0	17.8	20.2	11.9	19.5	18.6	19.6	18.8	5.0
4.8	10.2	11.0	5.4	5.1	4.0	7.1	17.9	5.9	3.3	13.1	10.4	8.2	9.1	10.0	2.3
56.2	42.1	47.4	55.1	49.4	58.0	14.3	39.3	53.0	51.4	42.9	52.8	51.1	43.6	37.5	10.3
18.5	27.7	18.3	18.7	23.3	19.3	35.7	17.9	20.1	23.9	26.2	12.3	18.5	17.0	20.8	4.8
92.7	81.1	37.7	89.0	90.8	90.2	100.0	18.2	83.6	90.4	83.3	25.0	56.0	89.2	35.2	61.9
1.1	11.0	54.8	4.7	0.0	2.9	0.0	72.7	9.5	1.6	11.1	69.0	37.3	0.0	56.2	28.6
6.2	7.8	7.6	6.3	9.2	6.9	0.0	9.1	6.9	8.0	5.6	6.0	6.6	10.8	8.6	9.5

SOURCE: National Research Council, Office of Scientific and Engineering Personnel, Doctorate Records File.

APPENDIX A, TABLE 6 Institutions Granting Doctorates, by Summary Field, 1988 [1/]

	1988 Total	Physics and Astronomy	Chemistry	Earth, Atmos., and Marine Sci.	Math and Computer Sci.	Engineering	Biosciences	Health Sciences	Agricultural Sciences	Psychology	Other Social Sciences	History	Eng. and Amer. Lang. and Lit.	Other Humanities	Education	Professional and Other Flds.
TOTAL ALL INSTITUTIONS [2/]	33456	1302	2018	726	1263	4190	4106	867	1170	3058	2711	603	716	2234	6349	2143
ALABAMA																
Auburn University	113	2	1		3	22	5	1	16	17	1	2	2		41	
Univ of Alabama-Birmingham	54		1		1	2	15	24		4					6	1
Univ of Alabama-Huntsville	6	2				4										
Univ of Alabama-University	107		2	1	5	9	5			9	4	3	4	3	49	13
Univ of South Alabama	5						5									
ALASKA																
Univ of Alaska	14	1		8	1		2		2							
ARIZONA																
Arizona State Univ	161	8	11	4	1	26	6	3		13	16		5	13	38	17
Northern Arizona Univ	46						8				1	2			35	
Univ of Arizona	289	30	20	21	11	28	45	6	22	24	22	1	3	16	31	9
ARKANSAS																
U of Arkansas-Fayetteville	95	8	8			8	1		9	4	2	3	4	2	32	14
U of Arkansas-Med Sci Camp	6						6									
CALIFORNIA																
Biola Univ	4									4						
Cal Inst Integral Studies	17									15	1			1		
Cal Inst of Technology	146	31	29	11	5	53	14				3					
Cal Sch Prof Psych-Berkeley	57									57						
Cal Sch Prof Psych-Fresno	15									15						
Cal Sch Prof Psych-LA	57									57						
Cal Sch Prof Psych-San Diego	37									37						
Claremont Graduate School	100				1		1			8	20	4		15	38	13
Fielding Institute	29									27						2
Fuller Theological Seminary	35									22	1				1	11
Golden Gate Baptist Theo Sem	5													1		4
Golden Gate Univ	9															9
Graduate Theological Union	19													8		11
Loma Linda Univ	13			1			5	2							5	
Naval Postgraduate School	14	1		4	1	8										
Pacific Grad Sch of Psych	17									17						
Pepperdine Univ	26														26	
Rand Grad Sch Policy Studies	8										8					
Saybrook Institute	14									12						2
Stanford Univ	552	45	32	28	29	168	44	2	5	10	45	12	15	44	56	17
U.S. International Univ	119									66	2				25	26
Univ of California-Berkeley	758	34	74	18	62	182	103	13	12	13	83	17	18	56	33	40
Univ of California-Davis	274	15	17	3	8	32	128	7	26	8	15	1	6	7		1
Univ of California-Irvine	120	12	13		12	12	27			10	13	7	3	10		1
Univ of Calif-Los Angeles	547	37	28	16	33	59	91	21		31	53	28	10	73	42	25
Univ of Calif-Riverside	115	6	10		4		23		10	7	26	2	12	2	13	
Univ of Calif-San Diego	199	12	23	18	15	32	35			9	27	3	3	21		1
Univ of Calif-San Francisco	62		9				30	17		1	5					
Univ of Calif-Santa Barbara	168	13	15	5	7	29	17	2		11	23	13	3	19	11	
Univ of Calif-Santa Cruz	52	7	11	7			6			5	7		1	8		
Univ of La Verne	10														9	1
Univ of the Pacific	18							1							17	
Univ of San Diego	10														10	
Univ of San Francisco	45														45	
Univ of Santa Clara	4					2										2
Univ of Southern California	359	7	8	3	1	49	24	5		31	26	7	10	30	111	47
Wright Institute, The	17									17						
COLORADO																
Colorado School of Mines	33		1	16	2	10					3					1
Colorado State Univ	201	7	14	14	11	39	39	4	26	7	9				27	4
Univ of Colorado	244	20	24	10	5	29	33	5		23	28	5	1	24	26	11
Univ of Denver	70	1	2					1		13	10	1	7	5	21	9
Univ of Northern Colorado	66				3		1	2		4	2			3	50	1
CONNECTICUT																
Univ of Connecticut	180	9	11	4	8	24	36	4	1	15	14	5	2	9	37	1
Univ of Hartford	4													4		
Wesleyan Univ	12		1		1		10									
Yale Univ	289	23	18	4	13	11	56	8	6	12	38	16	7	64		13
DELAWARE																
Univ of Delaware	109	3	12	1	5	38	8		1	10	5	3	6	8	9	
DISTRICT OF COLUMBIA																
American Univ	68	1	3		1		3			6	30	2		7	15	
Catholic Univ of America	126	1	1			4	3	10		16	9	3	1	32	15	31
Gallaudet Univ	1														1	
George Washington Univ	175	1		2	5	33	18	1		12	25		5	10	45	18
Georgetown Univ	69	1	13				17			2	6	4		24	1	1
Howard Univ	86	3	3		2	2	18	1		11	17	5	2	1	6	15

1/ Field groupings may differ from those in reports published by federal sponsors of the Survey of Earned Doctorates. See inside the back cover for a description of fields as reported in this table. Refer also to the explanatory note about this table in front of Appendix A.

2/ Includes the 50 states, the District of Columbia, and Puerto Rico.

	1988 Total	Physics and Astronomy	Chemistry	Earth, Atmos., and Marine Sci.	Math and Computer Sci.	Engineering	Biosciences	Health Sciences	Agricultural Sciences	Psychology	Other Social Sciences	History	Eng. and Amer. Lang. and Lit.	Other Humanities	Education	Professional and Other Flds
FLORIDA																
Barry Univ	3															3
Florida Atlantic Univ	24					3				1					19	1
Florida Inst of Technology	18			1	1	6	2			7					1	
Florida International Univ	1															1
Florida State Univ	252	8	4	9	7		22	1		33	29	1	6	31	69	32
Nova Univ	282			1	9					10					234	28
Univ of Central Florida	13				3	3									7	
Univ of Florida	314	5	35	3	7	68	39	6	38	25	12	3	2	8	46	17
Univ of Miami	109	3	9	10	1	17	15	1	1	22	5		1	11	11	2
Univ of South Florida	69		2	3	5	5	8			14	1		3		28	
GEORGIA																
Atlanta Univ	58		2				7			1	15		2	3	24	4
Emory Univ	82		8				15			9	2	5	8	30	2	3
Georgia Inst of Technology	96	3	16	1	8	59	3			3						3
Georgia State Univ	135				2		2			28	8	1			80	14
Medical College of Georgia	5						5									
Univ of Georgia	315	3	8	4	4		56	9	26	35	16	1	4	16	106	27
HAWAII																
Univ of Hawaii at Manoa	111	10	1	7		3	20	7	13	8	12	7		4	19	
IDAHO																
Idaho State Univ	16				2		5				2		4		3	
Univ of Idaho	46	1	4	1		7	5		13						14	1
ILLINOIS																
DePaul Univ	19									14				5		
Illinois Inst of Technology	66	2			11	34				16						3
Illinois State Univ-Normal	50				2		5					6	4		33	
Loyola Univ of Chicago	65		3				8			15	4	4	3	2	26	
Lutheran Sch of Theol-Chicgo	3															3
Northern Illinois Univ	92		6	1			2			5	8	8	7	2	53	
Northwestern Univ	314	5	22	5	26	75	30	4		33	22	5	3	47	21	16
Rush Univ	17						11	6								
Southern Ill Univ-Carbondale	160	2	6		2	2	12	2	1	17	8	1	4	4	84	15
Southern Ill Univ-Edwardsvle	14														14	
Univ of Chicago	319	20	28	4	13		47	1		16	72	20	8	53	10	27
U of Health Sci-Chicago Med	14						6			8						
U of Ill-Chicago	144	3	10		9	27	35	20		11	14	3	2	2	5	3
U of Ill-Urbana-Champaign	646	40	40	5	35	131	62	7	63	28	35	5	9	48	94	44
INDIANA																
Ball State Univ	72						1	1		10	2	4	4	7	43	
Indiana State Univ	26									10	5				11	
Indiana Univ-Bloomington	341	8	19	8	8		52	8	1	19	41	13	12	56	67	29
Indiana Univ Sch of Medicine	12							12								
Purdue Univ	365	15	40	10	18	119	29	11	32	19	20	2	9	5	19	17
Univ of Notre Dame	81	9	10		5	11	7			4	12	4	7	7		5
IOWA																
Drake Univ	12												1	1	10	
Iowa State Univ	309	10	36	5	17	57	38	4	56	15	22				46	3
Maharishi Intl Univ	5						3			2						
Univ of Northern Iowa	10					2									7	1
Univ of Iowa	312	5	9	5	17	36	38	16		20	14	5	10	52	65	20
KANSAS																
Kansas State Univ	156	1	11	1	4	19	24	1	31	8	6				47	3
Univ of Kansas	213	3	10	2	3	5	31	6		35	16	2	3	28	57	12
Wichita State Univ	7					5		2								
KENTUCKY																
Southern Bapt Theolog Semin	45											1		17	9	18
Univ of Kentucky	154	5	11	1	3	10	16	2	16	14	17	2	2	7	22	26
Univ of Louisville	49		4			1	20	1		9	2		1	1	9	1
LOUISIANA																
Grambling St Univ	2														2	
Louisiana St U & A&M College	169	7	14	5	8	22	19	6	26	7	9	2	2	17	18	7
Louisiana St U Med-New Orlns	6						6									
Louisiana St U Med-Shreveprt	2						2									
Louisiana Tech Univ	17					3										14
New Orleans Bapt Theolog Sem	34													7	8	19
Northeast Louisiana Univ	3						3									
Northwestern St Univ of LA	3														3	
Tulane Univ of Louisiana	65	1	2		5	6	8	10		13	9	3	2	5		1
Univ of New Orleans	25		4							2	2				16	1
U of Southwestern Louisiana	14				10						1		3			
MAINE																
Univ of Maine	25	4	3			1	5		2	4		2			4	

APPENDIX A, TABLE 6 (Continued) 1/

	1988 Total	Physics and Astronomy	Chemistry	Earth, Atmos., and Marine Sci.	Math and Computer Sci.	Engineering	Biosciences	Health Sciences	Agricultural Sciences	Psychology	Other Social Sciences	History	Eng. and Amer. Lang. and Lit.	Other Humanities	Education	Professional and Other Flds.
MARYLAND																
Johns Hopkins Univ	267	10	8	12	8	26	61	58		4	33	16	3	16	12	
Morgan State Univ	2														2	
Peabody Inst Johns Hopkins	5													5		
St. Mary's Sem. & Univ	4															4
Uniformed Serv U of Hlth Sci	11						8			3						
U of Maryland-Baltimore Cnty	12				4		3			2	2			1		
U of Maryland-College Park	364	22	20	4	19	40	28	3	13	34	25	7	8	23	97	21
U of Maryland Sch of Med	33		1				14	10								8
MASSACHUSETTS																
Boston College	99	4	3							20	12	2	3	4	44	7
Boston Univ	251	4	2	2	7	1	34	17		28	38	6	2	20	76	14
Brandeis Univ	85	6	10		3		15			1	20	6	4	16		4
Clark Univ	29	2	1				2			8	16					
Harvard Univ	455	28	26	9	15	6	76	20		9	70	16	9	54	93	24
Mass Coll Pharm & Health Sci	6		2				1	3								
Mass Inst of Technology	515	40	41	37	31	233	39		1	4	53	1		13		22
Northeastern Univ	53	5	17		2	6	4			6	5				8	
Simmons College	7															7
Smith College	4															4
Springfield College	3														3	
Tufts Univ	46	2	6		1	4	16	1		2	10		2	2		
Univ of Lowell	11	1	5			1	2								2	
Univ of Mass-Amherst	281	13	15	2	14	40	26	2	9	15	22		3	11	99	10
Univ of Mass-Harbor Campus	1			1												
Worcester Polytechnic Inst	10					8	2									
MICHIGAN																
Andrews Univ	20									2				3	12	3
Michigan State Univ	417	9	26	3	14	35	48	1	62	34	37	3	10	11	89	35
Michigan Technological Univ	10	1		3		5			1							
Oakland Univ	4	2	1			1										
Univ of Detroit	6		2							4						
Univ of Michigan	561	18	22	16	17	105	68	34	1	34	58	14	16	65	63	30
Wayne State Univ	137	4	16		3	10	24	2		19	8	1	1	5	37	7
Western Michigan Univ	47		2		1					8	1				30	5
MINNESOTA																
Univ of Minnesota-Minneapls	525	12	32	10	16	63	81	30	45	40	38	9	15	31	70	33
MISSISSIPPI																
Delta State Univ	6														6	
Jackson State Univ	4														4	
Mississippi State Univ	88		3		1	4	11		29	3	4	2			18	13
Univ of Mississippi	67	2	5		2	2	3	3		7	1		4		31	7
U of Mississippi-Med Center	5						5									
Univ of Southern Mississippi	74	1	3				3	2		29		1	1	2	30	2
MISSOURI																
Concordia Seminary	3															3
Midwest Bapt Theolog Semin	24													6		18
St. Louis Univ	77			2			12	2		13	4	2	2	3	33	4
U of Missouri-Columbia	227	6	6	1	3	22	23	1	20	33	27		6	9	54	16
U of Missouri-Kansas City	37		1				1	2		12				8	13	
U of Missouri-Rolla	37	1	4	1	2	28										1
U of Missouri-St. Louis	19		7							6					6	
Washington University	121	9	9	3	4	16	37			7	17	2	2	5	6	4
MONTANA																
Montana State Univ	36	2	7		1	4	3	1	3						15	
Univ of Montana	28		2		1		6		1	8	1				9	
NEBRASKA																
Creighton Univ	2						2									
Univ of Nebraska-Lincoln	246	5	14	2	5	9	21	2	38	28	14	2	8	6	63	29
NEVADA																
Univ of Nevada-Las Vegas	8														8	
Univ of Nevada-Reno	25	3	3	2			6			3				1	7	
NEW HAMPSHIRE																
Dartmouth College	30	2	6	3	1	4	10			4						
Univ of New Hampshire	30	3	5			4	4		2	3	3	2	1		3	
NEW JERSEY																
Drew Univ	27											2	7	8		10
Fairleigh Dickinson Univ	27									7					20	
New Jersey Inst Technology	5					5										
Princeton Theolog Seminary	12											2		4		6
Princeton Univ	271	26	25	12	25	42	19			7	47	10	10	47		1

1/ Field groupings may differ from those in reports published by federal sponsors of the Survey of Earned Doctorates. See inside the back cover for a description of fields as reported in this table. Refer also to the explanatory note about this table in front of Appendix A.

	1988 Total	Physics and Astronomy	Chemistry	Earth, Atmos., and Marine Sci	Math and Computer Sci.	Engineering	Biosciences	Health Sciences	Agricultural Sciences	Psychology	Other Social Sciences	History	Eng. and Amer. Lang. and Lit.	Other Humanities	Education	Professional and Other Flds
NEW JERSEY (continued)																
Rutgers St U-New Brunswick	292	9	16	3	12	23	62	2	17	12	19	10	7	11	76	13
Rutgers St U-Newark	13		2				6			1	3					1
Seton Hall Univ	26		4							11					11	
Stevens Inst of Technology	24	3	2		6	10	1			2						
U of Med & Dent of NJ	12						12									
NEW MEXICO																
New Mexico Inst Mining&Tech	7	1	1	4		1										
New Mexico State Univ	57	3	6		6	12	5		6	8					11	
Univ of New Mexico	144	9	6	4	4	25	10	4		6	14	5		16	41	
NEW YORK																
Adelphi Univ	58				3			10		33						12
Alfred Univ	7					7										
City U of NY-Grad Sch/U Ctr	257	10	9		4	20	54	7		59	38	3	5	26	3	19
Clarkson Univ	26	2	1		2	19	2									
Columbia Univ	389	17	13	10	12	45	30	18		33	63	25	17	55	6	45
Columbia U-Teachers College	228														228	
Cornell Univ	465	38	19	4	32	80	74	6	64	8	52	9	13	35	16	15
Cornell Univ Medical College	24						23	1								
Fordham Univ	114						2			34	19	1	12	5	22	19
Hofstra Univ	62									45					17	
Jewish Theol Sem of America	7													5	2	
The Juilliard School	9													9		
Long Island U-Brooklyn Camp	16									16						
Manhattan School of Music	8													8		
New School for Social Rsrch	45									21	24					
New York Medical College	6						6									
New York Univ	417	8	8	2	27	3	34	35		59	34	12	14	73	61	47
Pace Univ	2															2
Polytechnic Inst of New York	46	3	6		8	29										
Rensselaer Polytechnic Inst	129	9	15		7	84	4				4					6
Rockefeller Univ	18	3					15									
St. Bonaventure Univ	1						1									
St. John's Univ	42		3				9	4		16	2		2		6	
State Univ of NY-Albany	136	5	6	4	4		15			28	20		7	10	29	8
State Univ of NY-Binghamton	68		5	2	8	4				11	17	1	8	11		1
State Univ of NY-Buffalo	290	8	17	2	10	38	47	7		31	19	4	18	15	58	16
SUNY Coll-Envirn Sci&Forstry	20		3	3		1	5		7		1					
SUNY-Hlth Sci Ctr-Brooklyn	7						7									
SUNY-Hlth Sci Ctr-Syracuse	6						6									
State Univ of NY-Stony Brook	172	25	16	7	16	9	28			23	15	4	7	21	1	
Syracuse Univ	160	6	9	2	3	27	9	2		22	25	2	3	6	34	10
Union Theological Seminary	11													5		6
Union U-Albany Med College	4						4									
Univ of Rochester	167	25	16	1	12	10	21	4		3	17	4	3	27	20	4
Yeshiva Univ	29									15					4	10
Yeshiva U-Einstein Coll Med	25						25									
NORTH CAROLINA																
Duke Univ	132	7	20	4	8	13	30			4	10	7	8	15	1	5
East Carolina U-Sch of Med	4						4									
North Carolina St U-Raleigh	242	6	10	4	9	72	43		39	14	13				31	1
U of N Carolina-Chapel Hill	301	4	45	3	14	8	52	30		22	26	9	12	19	47	10
U of N Carolina-Greensboro	83						3			13	8		2		54	3
Wake Forest Univ	26		1				25									
NORTH DAKOTA																
North Dakota State Univ	28		3			4	7		14							
Univ of North Dakota	36		9	2			9		1	8		1	1		5	
OHIO																
Air Force Inst of Technology	7	3			1	3										
Bowling Green State Univ	45						2	1		15	3	1	2	4	10	7
Case Western Reserve Univ	149	7	13	3	6	46	13	7		12	6	5	2	4		25
Cleveland State Univ	10		1			6	3									
Hebrew Union College	1											1				
Kent State Univ	101	6	3		2		5	2		22	6	3	7	4	29	12
Medical College of Ohio	12						10	2								
Miami Univ	34		6				5			6	2	1	3		11	
Ohio State Univ	538	25	43	10	19	54	54	8	19	39	42	9	14	32	121	49
Ohio Univ	76	3	6		3	2	4			13		1	1	3	24	16
Univ of Akron	63	2	13			13	2			6	1	1			25	
Univ of Cincinnati	188	12	19	7	1	29	22	11		14	7	3	2	22	28	11
Univ of Dayton	5					5										
Univ of Toledo	44		2		1	8	3			7			1		22	
Wright State Univ	3					1	2									

APPENDIX A, TABLE 6 (Continued) 1/

	1988 Total	Physics and Astronomy	Chemistry	Earth, Atmos., and Marine Sci.	Math and Computer Sci.	Engineering	Biosciences	Health Sciences	Agricultural Sciences	Psychology	Other Social Sciences	History	Eng. and Amer. Lang. and Lit.	Other Humanities	Education	Professional and Other Flds
OKLAHOMA																
Oklahoma State Univ	182	4	7		1	28	12		24	24	8		6	1	48	19
Univ of Oklahoma	140	2	5	7	5	20	17	10		7	10	2	1	14	29	11
Univ of Tulsa	24					7				2			3	1	11	
OREGON																
Oregon Graduate Center	17	2	2	4	3	6										
Oregon Health Sciences Univ	6						6									
Oregon State Univ	153	2	16	9	7	22	18	3	43	3	5				24	1
Portland State Univ	28					5	1			1	11				9	1
Univ of Oregon	166	9	8	2	4	1	3	1		23	8	3	1	14	83	6
PENNSYLVANIA																
Annenberg Research Inst	1													1		
Bryn Mawr College	28	2	1				2			7	6		2	4	1	3
Carnegie-Mellon Univ	143	9	8		24	61	8			5	4	8	4	4		8
Drexel Univ	41	3	4		1	28	2									3
Duquesne Univ	20		2					1		8				6		3
Hahnemann Univ	8						5			3						
Indiana Univ of Pennsylvania	23												12	4	7	
Lehigh Univ	81	6	4	1	5	38	4			3	1		4	1	14	
Med College of Pensylvania	7						7									
Pennsylvania State Univ	384	12	22	13	15	81	42	4	12	34	28	2	5	11	84	19
Phila Coll of Pharm & Sci	5			1			1	3								
Temple Univ	277	4	6		2		27	3		43	8	6	2	17	147	12
Thomas Jefferson Univ	14						14									
Univ of Pennsylvania	355	15	18	1	19	41	39	10		11	67	13	13	20	49	39
Univ of Pittsburgh	381	13	19	3	10	25	23	24		38	33	4	3	27	131	28
Villanova Univ	1		1													6
Westminster Theolog Semin	6															
PUERTO RICO																
Caribbean Ctr Adv Studies	9									9					4	
Inter Amer U PR-Metropol	4													6	2	
Univ of Puerto Rico	18		8				2									
RHODE ISLAND																
Brown Univ	156	10	15	9	23	20	6			4	24	3	12	30		
Univ of Rhode Island	81	3	8	12	4	10	10	1	6	17	1		8	1		
SOUTH CAROLINA																
Clemson Univ	70	4	11		5	12	13		11		3				4	7
Medical Univ South Carolina	13						13									
Univ of South Carolina	191	3	24	15	4	7	17	4		16	17	4	8	9	44	19
SOUTH DAKOTA																
S Dakota Sch of Mines & Tech	8			2		6										
South Dakota State Univ	7								3		4					
Univ of South Dakota	33						3			3					27	
TENNESSEE																
East Tennessee State Univ	11						1								10	
Geo Peabody Coll for Teachrs	76									2				1	73	
Meharry Medical College	6						6									
Memphis State Univ	58		1		1		3	2		14		1		6	19	11
Middle Tennessee State Univ	13		1									1	4	1	6	
Tennessee Technological Univ	5					5										
U of Tenn-Ctr for Health Sci	8						8									
Univ of Tennessee-Knoxville	213	5	18	4	3	21	24	3	7	36	12	1	6	4	40	29
Vanderbilt Univ	112	4	4	1	4	15	14			22	11	3	6	18	6	4
TEXAS																
Baylor College of Medicine	20						19	1								
Baylor Univ	13	1	2							1			2	3	3	1
Dallas Theological Seminary	10															10
East Texas State Univ	43									1					42	
Lamar Univ	5					5										
North Texas State Univ	164	4	3		7		13			13	7	3	1	11	78	24
Rice Univ	84	9	12	4	5	17	11			7	3	2	5	8		1
Sam Houston State Univ	6										6					
Southern Methodist Univ	34				5	16					7			3		3
Southwestern Bapt Theol Sem	62											1		12	11	38
Stephen F Austin St Univ	1								1							
Texas A&I Univ	3														3	
Texas A&M Univ	383	4	29	15	8	61	44	2	61	13	18	3	4	1	93	27
Texas Christian Univ	16	2	7							3		3	1			
Texas Southern Univ	20														20	
Texas Tech Univ	128	5	6	2	3	10	9		9	26	8	3	1	10	18	18
Texas Woman's Univ	88						7	21		11	2		3	2	23	19
Univ of Dallas	3									2				1		
Univ of Houston	183	7	10	3	6	21	10	1		20	14	4	3		60	24

1/ Field groupings may differ from those in reports published by federal sponsors of the Survey of Earned Doctorates. See inside the back cover for a description of fields as reported in this table. Refer also to the explanatory note about this table in front of Appendix A.

	1988 Total	Physics and Astronomy	Chemistry	Earth, Atmos., and Marine Sci.	Math and Computer Sci.	Engineering	Biosciences	Health Sciences	Agricultural Sciences	Psychology	Other Social Sciences	History	Eng. and Amer. Lang. and Lit.	Other Humanities	Education	Professional and Other Flds.
TEXAS (continued)																
Univ of Texas-Arlington	40	3	4		7	10				2	2			3		9
Univ of Texas-Austin	587	35	23	8	22	109	39	54		37	42	8	5	57	101	47
Univ of Texas-Dallas	54	6	1	7	6	2	12	3		3	3			2		9
Univ of Texas-El Paso	1			1												
U Tex-Hlth Sci Ctr-Dallas	30	1					22			7						
U Tex-Hlth Sci Ctr-Houston	54	1			1		29	22		1						
U Tex-Hlth Sci Ctr-San Anton	6						6									
U Tex-Med Brnch-Galveston	26						23	3								
UTAH																
Brigham Young Univ	131	2	4			10	10	1		18	9	1		2	70	4
Univ of Utah	204	6	28	15	16	26	12	9		21	17	3	9	6	21	15
Utah State Univ	78	3	3	1	1	15	20		16	7	3				8	1
VERMONT																
Middlebury College	1													1		
Univ of Vermont	42		10			5	9		1	14					3	
VIRGINIA																
College of William & Mary	35	5		9	1		1					1			18	
George Mason Univ	17						1				6				8	2
Old Dominion Univ	26			3	2	6	2			5	6				1	1
Union Theological Seminary	10											1		3		6
Univ of Virginia	231	14	13	5	7	40	31	4		19	15	5	9	21	42	6
Virginia Commonwealth Univ	45		6							19	3				6	11
VA Commonwlth U-Med Coll VA	44		6				36	2								
Virginia Polytch Inst & St U	287	7	13	9	5	84	19	1	21	14	20				69	25
WASHINGTON																
Gonzaga Univ	8														8	
Seattle Univ	28														28	
Univ of Washington	391	17	23	20	19	45	57	17	24	27	40	4	12	25	27	34
Washington State Univ	149	1	4	3	11	18	38	6	26	12	15	1	2		12	
WEST VIRGINIA																
West Virginia Univ	137	3	5	2		18	16	1	6	10	7	1	2		66	
WISCONSIN																
Institute of Paper Chemistry	10	1	4			2										3
Marquette Univ	42		4			6	4			2		2	1	3	12	8
Medical College of Wisconsin	8						8									
Univ of Wisconsin-Madison	682	30	45	29	46	107	93	11	47	21	57	19	7	43	84	43
Univ of Wisconsin-Milwaukee	56	3	8		2	5	1			1	19		5		8	4
WYOMING																
Univ of Wyoming	70	4	5	9	2	6	8		5	5	2				24	

Top 40 Doctorate-Granting Institutions, 1988

Institution	Number of Doctorates	Institution	Number of Doctorates
1. Univ of California-Berkeley	758	21. Univ of Maryland-College Park	364
2. Univ of Wisconsin-Madison	682	22. Univ of Southern California	359
3. Univ of Illinois-Urbana/Champaign	646	23. Univ of Pennsylvania	355
4. Univ of Texas-Austin	587	24. Indiana Univ-Bloomington	341
5. Univ of Michigan-Ann Arbor	561	25. Univ of Chicago	319
6. Stanford Univ	552	26. University of Georgia	315
7. Univ of California-Los Angeles	547	27. Northwestern Univ	314
8. Ohio State Univ	538	28. Univ of Florida	314
9. Univ of Minnesota-Minneapolis	525	29. Univ of Iowa	312
10. Massachusetts Inst of Technology	515	30. Iowa State Univ	309
11. Cornell Univ	465	31. Univ of N Carolina-Chapel Hill	301
12. Harvard Univ	455	32. Rutgers St Univ-New Brunswick	292
13. Michigan State Univ	417	33. State Univ of NY-Buffalo	290
14. New York Univ	417	34. Yale Univ	289
15. Univ of Washington	391	35. Univ of Arizona	289
16. Columbia Univ	389	36. Virginia Polytch Inst & St U	287
17. Pennsylvania State Univ	384	37. Nova Univ	282
18. Texas A&M Univ	383	38. Univ of Massachusetts-Amherst	281
19. Univ of Pittsburgh	381	39. Temple Univ	277
20. Purdue Univ	365	40. Univ of California-Davis	274

SOURCE: National Research Council, Office of Scientific and Engineering Personnel, Doctorate Records File.

APPENDIX TABLE B Number of Doctorate Recipients by Subfield, 1978-1988 1/

	Year of Doctorate										
	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988
TOTAL ALL FIELDS	30875	31239	31020	31357	31106	31280	31332	31291	31896	32367	33456
PHYSICAL SCIENCES	4193	4299	4111	4170	4291	4426	4452	4531	4807	5030	5309
MATHEMATICS	838	769	744	728	720	701	698	688	729	740	749
Applied Mathematics	108	111	102	118	108	125	108	116	135	131	142
Algebra	87	88	78	56	60	55	65	55	46	57	54
Analysis & Functional Analysis	118	111	91	105	98	76	71	83	81	86	76
Geometry	22	25	35	29	32	44	27	35	38	30	44
Logic	24	21	24	18	17	21	25	30	23	18	19
Number Theory	18	17	28	24	28	19	27	18	20	15	26
Probability & Math Statistics	168	165	151	163	165	151	181	150	141	143	152
Topology	56	61	57	55	45	44	42	35	34	41	27
Computing Theory & Practice	55	25	13	16	11	12	13	15	10	14	12
Operations Research	43	43	41	36	36	20	27	22	29	22	29
Mathematics, General	92	80	83	77	84	86	78	85	125	137	135
Mathematics, Other	47	22	41	31	36	48	34	44	47	46	33
COMPUTER SCIENCE	121	210	218	232	220	286	295	310	399	450	514
Computer Sciences	121	210	218	232	220	264	256	249	355	384	442
Information Sciences & Systems	-	-	-	-	-	22	39	61	44	66	72
PHYSICS AND ASTRONOMY	1067	1108	983	1015	1014	1043	1080	1080	1187	1237	1302
Astronomy	64	58	52	50	52	50	42	43	52	46	66
Astrophysics	74	57	69	59	50	65	56	57	57	54	64
Acoustics	14	13	23	13	11	14	21	10	15	17	16
Atomic and Molecular	88	72	69	66	96	71	77	58	70	79	77
Electron	-	-	-	-	-	1	2	4	2	6	2
Electromagnetism	10	6	-	-	-	-	-	-	-	-	-
Elementary Particles	135	121	117	119	119	136	138	154	147	159	174
Fluids	13	14	15	14	13	15	11	16	6	21	16
Nuclear	77	103	73	63	53	90	72	86	89	74	88
Optics	33	46	43	54	42	50	53	51	58	50	65
Plasma	68	62	59	65	69	72	73	55	61	72	65
Polymer	-	-	-	-	-	10	8	11	11	15	20
Thermal	11	7	5	7	-	-	-	-	-	-	-
Solid State	243	243	201	253	235	222	258	248	280	287	253
Physics, General	151	194	165	164	167	150	170	176	222	238	273
Physics, Other	86	112	92	88	107	97	99	111	117	119	123
CHEMISTRY	1544	1566	1538	1612	1680	1759	1765	1836	1903	1975	2018
Analytical	178	207	185	229	190	264	228	285	257	314	301
Agricultural and Food	8	11	-	-	-	-	-	-	-	-	-
Inorganic	201	195	189	188	226	215	233	251	260	240	250
Nuclear	13	14	14	12	20	13	18	7	18	13	7
Organic	454	469	484	494	519	503	525	494	511	511	529
Pharmaceutical	51	43	52	52	55	78	56	60	58	65	73
Physical	310	326	282	275	324	311	329	304	293	302	317
Polymer	57	67	61	62	50	62	63	84	72	96	81
Theoretical	46	50	47	33	32	48	37	48	41	46	50
Chemistry, General	161	126	157	193	175	177	183	213	289	297	316
Chemistry, Other	65	58	67	74	89	88	93	90	104	91	94
EARTH, ATMOSPHERIC, & MARINE SCI	623	646	628	583	657	637	614	617	589	628	726
Atmospheric Physics & Chemistry	22	16	19	15	17	21	11	16	21	24	19
Atmospheric Dynamics	21	26	20	27	22	16	25	21	16	17	25
Meteorology	-	-	-	-	-	17	28	23	27	17	35
Atmos & Meteorological Sci, General	-	-	-	-	-	16	5	10	7	16	14
Atmos & Meteorological Sci, Other	34	42	51	33	26	27	12	10	7	13	10
Geology	28	28	20	27	25	105	124	111	118	114	143
Geochemistry	51	57	51	48	51	48	43	48	37	31	45
Geophysics and Seismology	60	81	71	72	81	75	68	92	89	75	83
Paleontology	31	36	21	19	24	17	35	23	16	21	24
Fuel Technology, Petroleum	2	4	-	-	-	-	-	-	-	-	-
Mineralogy, Petrology	34	33	47	30	41	24	28	28	17	24	19
Stratigraphy, Sedimentation	32	34	40	42	47	25	16	23	14	22	30
Geomorphology & Glacial Geology	24	14	15	13	21	10	9	13	11	18	7
Applied Geology	15	19	27	21	25	8	7	8	4	5	7
Geological Sciences, General	45	37	48	45	38	15	10	11	12	18	9
Geological Sciences, Other	22	24	21	16	29	21	25	11	12	29	31
Environmental Sciences	45	53	40	54	53	50	45	42	35	29	58
Hydrology and Water Resources	31	20	27	21	24	20	18	17	16	18	24
Oceanography	98	91	85	70	92	87	78	68	78	73	82
Marine Sciences	28	31	25	30	41	22	21	24	22	38	28
Physical Sciences, Other	-	-	-	-	-	13	6	18	30	26	33

1/ Field groupings may differ from those in reports published by federal sponsors of the Survey of Earned Doctorates. See inside the back cover for a description of fields as reported in this table; see questionnaire Specialties List for names and codes of subfields included in the groupings.

	Year of Doctorate										
	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988
ENGINEERING	2423	2490	2479	2528	2646	2781	2913	3166	3376	3712	4190
Aerospace, Aeronautic & Astronautic	103	81	81	97	86	106	119	124	118	142	150
Agricultural	43	66	68	64	48	58	74	60	52	74	70
Bioengineering & Biomedical	79	69	68	64	59	74	70	69	67	75	114
Ceramic	24	24	24	24	20	24	25	19	23	42	30
Chemical	261	287	285	296	306	349	361	440	476	528	625
Civil	236	236	240	287	308	354	351	358	387	441	489
Communications	–	–	–	–	–	25	14	30	23	26	24
Computer	76	78	62	71	72	83	56	55	77	62	99
Electrical, Electronics	463	533	478	478	544	517	593	631	706	691	885
Engineering Mechanics	95	85	91	78	103	68	91	89	94	113	106
Engineering Physics	15	17	18	22	12	10	8	12	13	13	9
Engineering Science	–	–	–	–	–	30	28	31	30	26	32
Environmental Health Engineering	67	66	66	71	60	43	57	33	42	36	43
Industrial	51	82	77	66	79	86	84	92	101	120	127
Materials Science	125	125	143	113	147	157	168	188	187	238	252
Mechanical	282	281	293	282	334	311	336	424	442	543	611
Metallurgical	98	87	106	97	88	87	78	96	93	112	92
Mining and Mineral	7	4	4	8	7	22	16	16	22	27	17
Naval Architecture, Marine Eng	–	–	–	–	–	4	5	8	9	7	9
Nuclear	107	95	112	130	121	103	120	96	98	84	104
Ocean	–	–	–	–	–	12	11	25	14	24	21
Operations Research	84	67	63	80	58	44	50	54	54	51	44
Petroleum	19	24	31	21	27	22	17	24	18	23	33
Polymer	–	–	–	–	–	21	31	40	37	34	28
Systems	63	75	61	68	49	57	52	57	33	47	44
Engineering, General	44	32	42	36	29	30	29	26	55	54	49
Engineering, Other	81	76	66	75	89	84	72	69	103	79	83
LIFE SCIENCES	5040	5223	5461	5611	5709	5553	5757	5778	5734	5749	6143
BIOLOGICAL SCIENCES	3516	3646	3803	3804	3893	3741	3880	3791	3808	3836	4106
Biochemistry	607	603	673	645	649	647	606	581	576	573	613
Biophysics	110	133	108	99	91	88	90	69	72	86	97
Bacteriology	–	–	–	–	–	10	12	17	12	13	6
Plant Genetics	–	–	–	–	–	19	20	31	20	26	26
Plant Pathology	–	–	–	–	–	29	30	38	28	33	30
Plant Physiology	43	57	52	68	56	67	70	58	52	62	73
Botany, Other	148	141	144	147	146	116	126	120	121	106	112
Anatomy	144	141	147	156	163	107	103	135	86	92	88
Biometrics & Biostatistics	45	44	42	48	59	45	49	40	30	37	47
Cell Biology	33	39	44	47	41	118	123	100	130	127	117
Ecology	170	173	169	198	173	183	202	200	183	158	155
Hydrobiology	3	10	–	–	–	–	–	–	–	–	–
Embryology	15	14	18	20	10	13	15	15	9	6	7
Endocrinology	–	–	–	–	–	28	30	17	17	19	21
Entomology	146	162	161	143	170	141	156	173	170	123	133
Immunology	94	134	125	148	151	154	133	123	146	135	178
Molecular Biology	172	140	183	187	223	225	275	277	298	302	362
Microbiology & Bacteriology	349	349	365	355	324	–	–	–	–	–	–
Microbiology	–	–	–	–	–	309	346	289	326	301	333
Neurosciences	–	–	–	–	117	134	145	156	120	153	161
Nutritional Sciences	90	107	90	99	120	111	109	113	122	140	126
Parasitology	13	21	22	18	14	9	30	21	25	16	20
Toxicology	–	–	–	–	–	60	97	99	104	115	108
Human & Animal Genetics	–	–	–	–	–	95	82	105	91	114	118
Genetics	126	141	157	157	176	–	–	–	–	–	–
Human & Animal Pathology	90	85	108	106	97	97	88	110	91	127	112
Human & Animal Pharmacology	216	220	257	280	280	218	237	235	248	233	249
Human & Animal Physiology	315	314	340	327	309	246	237	244	240	247	225
Zoology, Other	231	249	226	198	199	192	158	147	155	139	167
Biological Sciences, General	191	187	209	204	196	174	190	190	213	229	262
Biological Sciences, Other	165	172	163	154	129	106	121	88	125	124	160
HEALTH SCIENCES	512	568	586	657	686	640	722	729	770	800	867
Audiology & Speech Pathology	143	139	123	140	129	113	104	99	82	107	93
Environmental Health	31	40	40	44	39	38	40	31	39	29	52
Public Health	1	–	1	4	3	54	53	103	103	96	122
Public Health & Epidemiology	98	121	127	157	159	–	–	–	–	–	–
Epidemiology	–	–	–	–	–	76	103	76	80	86	98
Nursing	32	53	77	89	112	126	161	183	216	218	246
Pharmacy	72	69	70	69	81	81	102	106	104	133	95
Veterinary Medicine	27	41	41	41	41	45	46	51	41	31	48
Health Sciences, General	15	19	15	24	16	20	14	13	27	12	23
Health Sciences, Other	93	86	92	89	106	87	99	67	78	88	90
AGRICULTURAL SCIENCES	1012	1009	1072	1150	1130	1172	1155	1258	1156	1113	1170
Agricultural Economics	159	154	160	168	179	157	158	147	158	136	155
Animal Breeding & Genetics	–	–	–	–	–	25	28	28	25	23	27
Animal Husbandry	21	26	25	19	22	–	–	–	–	–	–
Animal Nutrition	101	112	119	149	133	56	71	78	65	82	54
Dairy Sciences	–	–	–	–	–	–	–	–	–	–	12
Poultry Science	–	–	–	–	–	–	–	–	–	–	10
Animal Sciences, Other	–	–	–	–	–	92	90	95	91	77	86
Agronomy	137	138	151	177	159	149	137	158	159	143	141
Plant Breeding & Genetics	–	–	–	–	–	71	78	88	78	70	83

APPENDIX TABLE B (Continued) 1/

	Year of Doctorate										
	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988
Plant Pathology	89	88	118	99	114	92	57	89	85	76	46
Plant Protection-Pest Management	–	–	–	–	–	–	–	–	–	–	1
Plant Sciences, Other	–	–	–	–	–	16	20	21	22	20	23
Food Sciences	117	107	102	104	110	141	113	136	121	131	16
Food Engineering	–	–	–	–	–	–	–	–	–	–	6
Food Sciences, Other	–	–	–	–	–	–	–	–	–	–	119
Soil Sciences	97	71	79	90	83	85	99	97	103	74	18
Soil Chemistry/Microbiology	–	–	–	–	–	–	–	–	–	–	33
Soil Sciences, Other	–	–	–	–	–	–	–	–	–	–	62
Horticulture Science	65	69	73	85	88	72	66	76	60	71	61
Fisheries Science	–	–	–	–	–	36	45	36	32	32	42
Fish and Wildlife	61	66	73	66	65	–	–	–	–	–	–
Wildlife Management	–	–	–	–	–	31	31	38	20	23	3
Wildlife/Range Management	–	–	–	–	–	–	–	–	–	–	36
Forestry Science	88	87	80	95	78	90	94	105	88	100	15
Forestry Biology	–	–	–	–	–	–	–	–	–	–	21
Forestry Engineering	–	–	–	–	–	–	–	–	–	–	3
Forestry Management	–	–	–	–	–	–	–	–	–	–	18
Wood Science	–	–	–	–	–	–	–	–	–	–	7
Renewable Natural Resources	–	–	–	–	–	–	–	–	–	–	7
Forestry & Related Sciences, Other	–	–	–	–	–	–	–	–	–	–	35
Agriculture, General	6	7	3	5	5	7	1	5	4	5	9
Agriculture, Other	71	84	89	93	94	52	67	61	45	50	21
SOCIAL SCIENCES (INCL PSYCH)	6039	5961	5856	6142	5837	6096	5930	5765	5893	5797	5769
Anthropology	399	383	370	369	333	373	335	353	381	352	325
Area Studies	26	24	22	20	19	20	23	19	28	17	17
Criminology	–	–	30	35	36	49	41	38	24	29	43
Demography	–	–	–	–	–	26	19	25	15	26	19
Economics	778	780	745	808	737	792	767	785	835	798	825
Econometrics	23	22	22	17	24	21	27	27	25	25	27
Geography	158	129	131	109	106	121	114	120	120	111	130
International Relations	92	81	80	87	77	76	95	78	76	82	77
Political Science & Government	603	522	505	445	459	397	419	406	414	404	391
Public Policy Studies	–	–	–	–	–	69	54	70	81	83	74
Sociology	610	632	601	605	568	525	515	461	492	423	449
Statistics	46	23	33	40	43	47	39	60	65	49	47
Urban Studies	76	91	79	94	93	74	81	75	50	72	87
Social Sciences, General	33	33	32	22	34	17	17	17	36	30	29
Social Sciences, Other	140	150	108	133	149	142	127	114	127	119	171
PSYCHOLOGY	3055	3091	3098	3358	3159	3347	3257	3117	3124	3177	3058
Clinical	1061	1069	1106	1259	1168	1241	1195	1181	1172	1219	1089
Cognitive	–	–	–	–	–	65	77	76	70	80	83
Comparative	20	21	8	11	12	11	13	11	14	9	7
Counseling	278	315	299	351	348	432	464	431	449	487	482
Developmental	208	221	207	201	192	219	207	175	184	200	175
Experimental	299	293	307	283	240	209	169	165	147	146	134
Educational	145	163	137	180	140	154	210	127	106	90	103
Industrial & Organizational	74	87	66	87	83	90	106	102	110	107	117
Personality	41	42	43	49	36	32	25	21	16	25	18
Physiological	126	102	108	102	90	94	73	79	73	69	85
Psychometrics	15	25	21	27	8	10	6	10	11	9	11
Quantitative	–	–	–	–	–	14	17	16	25	13	12
School	125	125	176	133	166	121	89	92	116	93	115
Social	204	216	190	180	179	191	157	167	141	133	140
Psychology, General	299	207	210	279	242	292	267	265	308	339	360
Psychology, Other	160	205	220	216	255	172	182	199	184	158	127
HUMANITIES	4231	4141	3871	3751	3561	3500	3535	3428	3460	3504	3553
History, American	321	302	285	228	271	224	240	176	197	197	209
History, European	215	218	196	166	158	168	150	143	121	122	127
History of Science	25	28	21	26	29	13	24	23	24	25	22
History, General	–	–	–	–	–	58	76	85	83	95	104
History, Other	291	281	243	272	234	153	127	116	138	148	141
Classics	67	56	54	62	60	44	57	44	51	55	56
Comparative Literature	114	144	107	132	118	124	133	133	101	121	139
Linguistics	175	156	182	176	191	164	160	176	189	200	166
Speech and Debate	69	53	63	38	38	48	41	38	30	37	36
Letters, General	–	–	–	–	–	3	14	13	19	25	16
Letters, Other	–	–	–	–	1	19	31	26	37	39	43
American Studies	82	84	81	87	64	99	76	87	68	75	70
Archeology	32	35	26	28	21	30	31	24	28	31	23
Art History & Criticism	150	166	144	158	138	150	141	137	126	143	132
Music	368	419	402	368	402	391	445	447	476	500	505
Philosophy	290	278	255	277	251	241	215	238	247	234	223
Religion	189	198	173	165	151	177	182	181	182	181	216
Theatre	102	97	94	103	94	108	101	92	88	82	92
LANGUAGE AND LITERATURE	1662	1555	1487	1396	1260	1219	1225	1163	1164	1113	1146
American	212	206	209	145	154	173	190	203	215	190	186
English	813	703	743	675	616	542	543	525	504	479	530
French	183	187	162	167	119	121	108	86	102	103	100
German	103	116	99	88	74	77	80	62	79	77	76
Italian	23	20	10	16	17	22	17	14	15	21	14
Spanish	173	181	145	184	177	161	144	145	122	133	137

1/ Field groupings may differ from those in reports published by federal sponsors of the Survey of Earned Doctorates. See inside the back cover for a description of fields as reported in this table; see questionnaire Specialties List for names and codes of subfields included in the groupings.

	Year of Doctorate										
	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988
Russian	52	42	32	28	24	24	33	28	28	19	13
Slavic	-	-	-	-	-	9	12	10	8	5	4
Chinese	-	-	-	-	-	16	13	14	13	13	12
Japanese	-	-	-	-	-	5	12	13	9	9	6
Hebrew	-	-	-	-	-	11	13	9	11	13	11
Arabic	-	-	-	-	-	8	8	5	9	8	14
Other Languages	103	100	87	93	79	50	52	49	49	43	43
Humanities, General	25	19	12	23	28	17	22	27	23	23	24
Humanities, Other	54	52	46	46	52	50	44	59	68	58	63
PROFESSIONAL FIELDS	1741	1717	1634	1623	1787	1728	1922	1864	1954	2068	2092
Business Administration	713	715	640	624	685	750	869	790	902	983	1039
Accounting	-	-	-	-	-	163	164	150	157	161	174
Banking and Finance	-	-	-	-	-	94	123	104	126	156	148
Business Administration & Management	-	-	-	-	-	179	175	174	222	225	267
Business Economics	-	-	-	-	-	25	30	20	28	27	27
Marketing Management & Research	-	-	-	-	-	73	126	94	110	113	126
Business Statistics	-	-	-	-	-	8	7	9	3	8	6
Operations Research	-	-	-	-	-	38	46	45	46	64	50
Organizational Behavior	-	-	-	-	-	53	70	68	57	66	74
Business & Management, General	-	-	-	-	-	35	49	49	56	75	80
Business & Management, Other	713	715	640	624	685	82	79	77	97	88	87
COMMUNICATIONS	292	285	270	240	266	250	255	266	258	309	247
Communications Research	-	-	-	-	-	51	66	55	79	90	72
Journalism	22	17	17	18	18	20	17	22	18	7	21
Radio and Television	-	-	-	-	-	27	20	19	13	16	12
Communications, General	-	-	-	-	-	60	68	69	75	102	70
Communications, Other	270	268	253	222	248	92	84	81	73	94	72
OTHER PROFESSIONAL FIELDS	736	717	724	759	836	728	798	808	794	776	806
Architecture, Environmental Design	-	-	-	-	-	34	25	36	27	33	31
Home Economics	81	88	90	85	98	79	107	90	88	67	58
Law	22	24	21	28	21	19	24	25	31	27	33
Library & Archival Science	57	66	66	62	83	51	68	72	57	48	57
Public Administration	156	164	145	147	173	113	127	112	88	78	92
Social Work	173	154	179	213	218	190	231	219	237	214	236
Theology	227	193	195	201	209	225	208	236	236	254	250
Professional Fields, General	-	-	-	-	-	-	2	-	-	1	2
Professional Fields, Other	20	28	28	23	34	17	6	18	30	54	47
EDUCATION	7194	7385	7586	7497	7251	7174	6808	6734	6646	6445	6349
Curriculum and Instruction	808	874	838	815	811	861	869	825	793	763	810
Educational Admin & Supervis	1455	1500	1536	1659	1474	1632	1569	1625	1636	1686	1747
Educational Media	92	92	75	77	76	88	83	101	79	68	67
Educational Measures & Statistics	97	104	89	90	94	-	-	-	-	-	-
Educational Statistics & Research	-	-	-	-	-	86	105	74	58	73	50
Educational Testing, Eval & Meas	-	-	-	-	-	51	56	44	47	37	55
Educational Psychology	445	415	476	445	454	274	233	389	330	314	321
School Psychology	-	-	-	-	-	88	110	102	92	95	98
Social Foundations	237	242	214	209	214	142	151	135	124	114	122
Special Education	311	316	346	312	347	349	312	270	273	248	257
Student Counseling, Personnel Serv	560	607	594	549	540	506	391	397	316	315	322
Higher Education	615	683	685	671	653	635	657	589	613	570	399
Pre-elementary Education	-	-	74	90	78	63	54	65	86	73	83
Elementary Education	217	169	162	180	149	111	97	122	94	105	93
Secondary Education	134	154	168	136	104	88	62	69	87	66	68
Adult & Continuing Education	200	169	235	233	257	221	218	207	223	204	229
TEACHING FIELDS	1352	1411	1471	1437	1333	1327	1170	1118	1142	1064	986
Agricultural Education	35	24	39	43	35	47	47	40	39	39	32
Art Education	48	50	45	63	55	58	41	43	43	52	42
Business Education	62	66	52	50	44	62	52	52	50	36	44
English Education	80	80	76	64	67	76	72	68	79	72	57
Foreign Languages Education	39	35	36	29	31	25	25	30	37	37	53
Physical Educ, Health & Recreation	323	346	365	368	351	-	-	-	-	-	-
Health Education	-	-	-	-	-	99	93	89	81	91	86
Home Economics Education	26	29	27	25	33	25	26	21	17	17	17
Industrial Arts Education	43	29	27	27	39	19	27	13	20	24	11
Mathematics Education	57	85	74	62	50	62	64	65	72	74	55
Music Education	85	88	110	76	103	112	92	81	94	109	76
Nursing Education	-	-	41	23	25	17	21	21	40	36	34
Physical Education	-	-	-	-	-	235	219	220	210	192	183
Reading Education	142	151	160	193	153	169	142	113	134	94	74
Science Education	101	93	98	107	86	78	77	88	65	63	67
Social Science Education	46	65	52	49	29	39	22	24	22	17	23
Speech Education	20	16	10	12	12	2	10	7	5	5	5
Technical Education	-	-	-	-	-	-	-	-	-	-	13
Trade & Industrial Education	197	201	229	213	191	138	117	82	86	68	67
Other Teaching Fields	48	53	32	35	29	64	23	61	48	38	47
Education, General	425	410	427	405	419	349	311	294	355	366	363
Education, Other	246	239	196	189	248	303	360	308	298	284	279
OTHER AND UNSPECIFIED	14	23	22	35	24	22	15	25	25	62	51

SOURCE: National Research Council, Office of Scientific and Engineering Personnel, Doctorate Records File.

Form Approved
OMB No. 3145-0019
Approval Expires 3/89

SURVEY OF EARNED DOCTORATES 1987-88

This form is to be returned to the GRADUATE DEAN, for forwarding to:

Please print or type.

The Office of Scientific and Engineering Personnel
National Research Council
2101 Constitution Avenue, Washington, D.C. 20418

1. Name in full: _____ (Last Name) _____ (First Name) _____ (Middle Name)

Cross Reference: Maiden name or former name legally changed: _____

2. Permanent address through which you could always be reached: (Care of, if applicable) _____

_____ (Number) _____ (Street) _____ (City)

_____ (State) _____ (Zip Code) _____ (Or Country if not U.S.)

3. U.S. Social Security Number: ___ ___ ___ - ___ ___ - ___ ___ ___ ___

4. Date of birth: _____ (Month, Day, Year) Place of birth: _____ (State) _____ (Or Country if not U.S.)

5. Sex: 1 ☐ Male 2 ☐ Female

6. Marital status: 1 ☐ Married
2 ☐ Not married (including widowed, divorced)

7. Citizenship:
0 ☐ U.S. native
1 ☐ U.S. naturalized
2 ☐ Non-U.S., Immigrant (Permanent Resident)
_____ (country of present citizenship)
3 ☐ Non-U.S., Non-Immigrant (Temporary Resident)
_____ (country of present citizenship)

8. Are you physically handicapped? ☐ Yes ☐ No
If yes, is it: 1 ☐ Visual 2 ☐ Orthopedic
3 ☐ Auditory 4 ☐ Vocal
5 ☐ Other (Specify) _____

9. What is your racial background? (Check only one)
0 ☐ American Indian or Alaskan Native
1 ☐ Asian or Pacific Islander
2 ☐ Black
3 ☐ White

10a. Is your ethnic heritage Hispanic? ☐ Yes ☐ No

10b. If yes, is it: 0 ☐ Mexican American
1 ☐ Puerto Rican
2 ☐ Other Hispanic

11. Number of dependents: _____ Do not include yourself. (Dependent = someone receiving at least one half of his or her support from you)

EDUCATION

12. Location of high school last attended: _____ (State Or Country if not U.S.) Year of graduation from high school: _____

13. List in the table below all collegiate and graduate institutions you have attended including 2-year colleges and each degree earned. List chronologically, and include your doctoral institution as the last entry.

Institution Name	Location	Years Attended: From	Years Attended: To	Major Field: Use Specialties List: Name	Major Field: Use Specialties List: Number	Degree (if any): Title of Degree	Degree (if any): Granted: Mo	Degree (if any): Granted: Yr

14. In the spaces below, categorize the period of years between receiving your first baccalaureate degree (or equivalent) and receiving your doctorate, including the period spent on your thesis and/or dissertation. If necessary, round years so that your total will equal Year of Doctorate minus Year of Baccalaureate.
1. Number of years as full-time student: _____
2. Number of years as part-time student: _____
3. Number of years not working on degree: _____
Total = Year of Doctorate minus Year of BA: _____

15. Enter below the title of your doctoral dissertation and the most appropriate classification number and field. If a project report or a musical or literary composition (not a dissertation) is a degree requirement, please check box. ☐

Title _____ Classify field using Specialties List

_____ Number Name of field

_____ _____ _____

16. Name the department (or interdisciplinary committee, center, institute, etc.) and school or college of the university which supervised your doctoral program: _____
(Department, Institute, Committee, Program) (School)

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continued on next page

17. Name of your adviser for dissertation, project report, or music literary composition _____
Last Name First Name Middle Initial

18. What is your best estimate of the percentage of support received from the following sources during the course of your graduate study? (Total should equal 100%)

	%		%		%
Own Family Resources		**Research Assistant**		p ___ Other Dept of Ed	**Student Loans**
a ___ Own Earnings		i ___ NSF		q ___ Veterans Administration (G.I. Bill, etc.)	v ___ Guaranteed Student Loan
b ___ Spouse's Earnings		j ___ NIH		4 ___ USDA Fellowship	w ___ National Direct Student Loan
c ___ Family Contributions		2 ___ USDA		r ___ Other Federal	x ___ Other Loan
University-Related		k ___ Other Federal		Specify	Specify
d ___ Teaching Assistantship		**Other Federal Support**		**U.S. Nationally Competitive Fellowships (Non-Federal)**	**Other Sources**
e ___ Research Assistantship		3 ___ NSF Fellowship		s ___ Ford Foundation	y ___ Business/Employer Funds
f ___ University Fellowship		l ___ NIH Traineeship		t ___ Rockefeller Foundation	z ___ Foreign (Non-U.S.) Govt
g ___ College Work-Study		m ___ Other HHS		u ___ Other Fellowship	5 ___ Other
h ___ Other		n ___ Title VI Foreign Language & Area Studies Fellowship		Specify	Specify
Specify		o ___ Graduate & Professional Opportunities Program Fellowship (G*POP)			

19. When you receive your doctorate degree, will you have any debt directly related to your undergraduate and or graduate education (tuition and fees, living expenses, books and supplies, transportation to and from school)?
Yes No
If yes, what will be the level of this cumulative debt?
1 $5,000 or less
2 $5,001–$10,000
3 $10,001–$20,000
4 $20,001–$30,000
5 $30,001 or more

20a. Please check the category which most fully describes your status during the year immediately preceding the award of the doctorate.
0 Full-time employed (Go to item "20b.")
1 Held fellowship
2 Held assistantship
3 Part-time employed
4 Not employed
5 Other (specify) _____

20b. If full-time employed, what type of position did you hold?
6 College or university: faculty
7 College or university: non-faculty
8 Elem. or sec. school: teaching
9 Elem. or sec. school: non-teaching
(11) Industry or business
(12) Other (specify) _____

POSTGRADUATION PLANS

21. What is the status of your current postgraduate plans?
0 Am returning to, or continuing in, predoctoral employment
1 Have signed contract or made definite commitment
2 Am negotiating with one or more specific organizations
3 Am seeking position but have no specific prospects
4 Other (specify) _____

22. What best describes your immediate postgraduate plans?
0 Postdoctoral fellowship } Go to Item "23"
1 Postdoctoral research associateship } Go to Item "23"
2 Traineeship } Go to Item "23"
3 Other study (specify) _____ } Go to Item "23"
4 Employment (other than 0,1,2,3) } Go to Item "24"
5 Military service } Go to Item "24"
6 Other (specify) _____ } Go to Item "24"

23. If you plan to have a postdoctoral fellowship, associateship, traineeship, or otherwise undertake further study:
A What will be the field of your postdoctoral study? Please enter number from Specialties List _____
B What will be the primary source of research support?
0 U.S. Government
1 College or university
2 Private foundation
3 Nonprofit, other than private foundation
4 Other (specify) _____
6 Unknown
Go to Item "25"

24. If you plan to be employed, enter military service, or other:
A What will be the type of employer?
a U.S. 4-year college or university other than medical school
b Foreign university
c Medical school
d Jr. or community college
e Elem. or sec. school
f Foreign government
g U.S. Federal government
h U.S. state government
i U.S. local government
j Nonprofit organization
k Industry or business
l Self-employed
m Other (specify) _____
B Indicate what your **primary** work activity will be with "1" in appropriate box. **secondary** work activity (if any) with "2" in appropriate box.
0 Research and development
1 Teaching
2 Administration
3 Professional services to individuals
5 Other (specify) _____
C In what field will be your working? Please enter number from Specialties List _____

25. What is the name and address of the organization with which you will be associated?
Name of Organization _____
Street City, State Or Country if not U.S. _____

BACKGROUND INFORMATION

26. Please indicate, by circling the highest grade attained, the education of

	none	1 2 3 4 5 6 7 8	9 10 11 12	1 2 3 4	MA, MD	PhD	Postdoctoral
		Elementary School	High School	College	Graduate		
your father:	none	1 2 3 4 5 6 7 8	9 10 11 12	1 2 3 4	MA, MD	PhD	Postdoctoral
your mother:	0	1 2 3 4 5 6 7 8	9 10 11 12	1 2 3 4	MA, MD	PhD	Postdoctoral
				6 7	8	9	(11)

Signature _____ Date _____

If you would like to receive a summary of the results of this survey, please check box. ☐

SPECIALTIES LIST

Instructions: The following field listing is to be used in responding to items 13, 15, 23A, and 24C. If a field marked with an asterisk (*) is chosen in item 13 or 15, please write in your field of specialization in the space provided.

AGRICULTURE

000 Agricultural Economics
002 Agricultural Business & Mgmt
005 Animal Breeding & Genetics
010 Animal Nutrition
012 Dairy Science
014 Poultry Science
055 Fisheries Sciences
019 Animal Sciences, Other*
020 Agronomy
025 Plant Breeding & Genetics
030 Plant Path. (See also 120)
032 Plant Protection-Pest Mgmt
039 Plant Sciences, Other*
042 Food Distribution
043 Food Engineering
044 Food Sciences, Other*
046 Soil Chemistry Microbiology
049 Soil Sciences, Other*
050 Horticulture Science
056 Forest Biology
068 Forest Engineering
070 Forest Management
072 Wood Science
074 Renewable Natural Resources
079 Forestry & Related Sci., Other*
080 Wildlife Range Management
098 Agriculture, General
099 Agricultural Sciences, Other*

BIOLOGICAL SCIENCES

100 Biochemistry
105 Biophysics
110 Bacteriology
115 Plant Genetics
120 Plant Path. (See also 030)
125 Plant Physiology
129 Botany, Other*
130 Anatomy
133 Biometrics & Biostatistics
136 Cell Biology
139 Ecology
142 Embryology
145 Endocrinology
148 Entomology
151 Immunology
154 Molecular Biology
157 Microbiology
160 Neurosciences
163 Nutritional Sciences
166 Parasitology
169 Toxicology
170 Genetics, Human & Animal
175 Pathology, Human & Animal
180 Pharmacology, Hum. & Anim.
185 Physiology, Human & Animal
189 Zoology, Other*
198 Biological Sciences, General
199 Biological Sciences, Other*

HEALTH SCIENCES

200 Audiology & Speech Pathology
210 Environmental Health
215 Public Health
220 Epidemiology
230 Nursing
240 Pharmacy
250 Veterinary Medicine
298 Health Sciences, General
299 Health Sciences, Other*

ENGINEERING

300 Aerospace, Aeronautical & Astronautical
303 Agricultural
306 Bioengineering & Biomedical
309 Ceramic
312 Chemical
315 Civil
318 Communications
321 Computer
324 Electrical, Electronics
327 Engineering Mechanics
330 Engineering Physics
333 Engineering Science
336 Environmental Health Engin.
339 Industrial
342 Materials Science
345 Mechanical
348 Metallurgical
351 Mining & Mineral
354 Naval Arch. & Marine Engin.
357 Nuclear
360 Ocean
363 Operations Research (See also 465, 930)
366 Petroleum
369 Polymer
372 Systems
398 Engineering, General
399 Engineering, Other*

COMPUTER AND INFORMATION SCIENCES

400 Computer Sciences*
410 Information Sci. & Systems*

MATHEMATICS

420 Applied Mathematics
425 Algebra
430 Analysis & Functional Analysis
435 Geometry
440 Logic (See also 785)
445 Number Theory
450 Probability & Math. Statistics (See also 690)
455 Topology
460 Computing Theory & Practice
465 Operations Research (See also 363, 930)
498 Mathematics, General
499 Mathematics, Other*

PHYSICAL SCIENCES

Astronomy

500 Astronomy
505 Astrophysics

Atmospheric & Meteorological Sciences

510 Atmospheric Physics & Chem.
512 Atmospheric Dynamics
514 Meteorology
518 Atmos. & Meteor. Sci., Gen.
519 Atmos. & Meteor. Sci., Other*

Chemistry

520 Analytical
522 Inorganic
524 Nuclear
526 Organic
528 Pharmaceutical
530 Physical
532 Polymer
534 Theoretical
538 Chemistry, General
539 Chemistry, Other*

Geological Sciences

540 Geology
542 Geochemistry
544 Geophysics & Seismology
546 Paleontology
548 Mineralogy, Petrology
550 Stratigraphy, Sedimentation
552 Geomorphology & Glacial Geol.
554 Applied Geology
558 Geological Sciences, General
559 Geological Sciences, Other*

Physics

560 Acoustics
561 Atomic & Molecular
562 Electron
564 Elementary Particle
566 Fluids
568 Nuclear
569 Optics
570 Plasma
572 Polymer
574 Solid State
578 Physics, General
579 Physics, Other*

Other Physical Sciences

580 Environmental Sciences
585 Hydrology & Water Resources
590 Oceanography
595 Marine Sciences
599 Physical Sciences, Other*

PSYCHOLOGY

600 Clinical
603 Cognitive
606 Comparative
609 Counseling
612 Developmental
615 Experimental
618 Educational (See also 822)
621 Industrial & Organizational (See also 935)
624 Personality
627 Physiological
630 Psychometrics
633 Quantitative
636 School (See also 825)
639 Social
648 Psychology, General
649 Psychology, Other*

SOCIAL SCIENCES

650 Anthropology
652 Area Studies
658 Criminology
662 Demography
666 Economics
668 Econometrics
670 Geography
674 International Relations
678 Political Sci. & Government
682 Public Policy Studies
686 Sociology
690 Statistics (See also 450)
694 Urban Studies
698 Social Sciences, General
699 Social Sciences, Other*

HUMANITIES

History

700 History, American
705 History, European
710 History of Science
718 History, General
719 History, Other*

Letters

720 Classics
723 Comparative Literature
729 Linguistics
732 Literature, American
733 Literature, English
734 English Language
736 Speech & Debate
738 Letters, General
739 Letters, Other*

Foreign Languages and Literature

740 French
743 German
746 Italian
749 Spanish
752 Russian
755 Slavic (other than Russian)
758 Chinese
762 Japanese
765 Hebrew
768 Arabic
769 Other Languages*

Other Humanities

770 American Studies
773 Archeology
776 Art History & Criticism
780 Music
785 Philosophy (See also 440)
790 Religion (See also 984)
795 Theatre
798 Humanities, General
799 Humanities, Other*

EDUCATION

800 Curriculum & Instruction
805 Educ. Administration & Supervision
810 Educational Media
815 Educ. Stat. & Research
820 Educ. Testing, Evaluation & Measurement
822 Educational Psychology (See also 618)
825 School Psychology (See also 636)
830 Social Foundations
835 Special Education
840 Student Counseling & Personnel Services
845 Higher Education Research

Teacher Education

850 Pre-elementary
852 Elementary
856 Secondary
858 Adult & Continuing

Teaching Fields

860 Agricultural Educ.
861 Art Educ.
862 Business Educ.
864 English Educ.
866 Foreign Languages Educ.
868 Health Educ.
870 Home Economics Educ.
872 Industrial Arts Educ.
874 Mathematics Educ.
876 Music Educ.
878 Nursing Educ.
880 Physical Educ.
882 Reading Educ.
884 Science Educ.
885 Social Science Educ.
886 Speech Educ.
887 Technical Educ.
888 Trade & Industrial Educ.
889 Teacher & Educ. Specific Subject Areas, Other*
898 Education, General
899 Education, Other*

PROFESSIONAL FIELDS

Business & Management

900 Accounting
905 Banking & Finance
910 Business Admin. & Management
915 Business Economics
920 Marketing Mgmt. & Research
925 Business Statistics
930 Operations Research (See also 363, 465)
935 Organiz. Beh. (See also 621)
938 Business & Mgmt., General
939 Business & Mgmt., Other*

Communications

940 Communications Research
945 Journalism
950 Radio & Television
958 Communications, General
959 Communications, Other*

Other Professional Fields

960 Architec. & Environ. Design
964 Home Economics
968 Law
972 Library & Archival Science
976 Public Administration
980 Social Work
984 Theology (See also 790)
988 Professional Fields, General
989 Professional Fields, Other*

999 OTHER FIELDS*

The Appendix tables present data according to the following field classifications. Appendix A, Tables 1 and 1A and Appendix Table B display all subfields that are on the survey Specialties List. Appendix A, Tables 3, 4, and 5 show data by seven broad fields only. Appendix A, Tables 2 and 6 include the additional field groupings indicated below.

SCIENCES

Physical Sciences (400-599)
- Physics and Astronomy (500-505, 560-579)
- Chemistry (520-539)
- Earth, Atmospheric and Marine Sciences (510-519, 540-559, 580-599)
- Mathematics (420-499)
- Computer Sciences (400-410)

} Combined in Table 6

Engineering (300-399)

Life Sciences (000-299)
- Biological Sciences (100-199)
  - Biochemistry (100)
  - Other Biological Sciences (105-199)
- Health Sciences (200-299)
- Agricultural Sciences (000-099)

Social Sciences (600-699)
- Psychology (600-649)
- Economics and Econometrics (666, 668)
- Anthropology and Sociology (650, 686)
- Political Science and International Relations (674, 678)
- Other Social Sciences (652-662, 670, 682, 690-699)

} Combined in Table 6

NONSCIENCES

Humanities (700-799)
- History (700-719)
- English and American Language and Literature (732-734)
- Foreign Languages and Literature (740-769)
- Other Humanities (720-729, 736-739, 770-799)

} Combined in Table 6

Education (800-899)

Professional and Other Fields (900-999)
- Business and Management (900-939)
- Other Professional Fields (940-989)
- Other Fields (999)

TITLES OF DEGREES INCLUDED IN THE SURVEY OF EARNED DOCTORATES

DAS	Doctor of Applied Science
DArch	Doctor of Architecture
DA	Doctor of Arts
DBA	Doctor of Business Administration
JCD	Doctor of Canon Law
DChem	Doctor of Chemistry
DCL	Doctor of Comparative Law/Civil Law
DCJ	Doctor of Criminal Justice
DCrim	Doctor of Criminology
EdD	Doctor of Education
DEng	Doctor of Engineering
DESc/ScDE	Doctor of Engineering Science
DEnv	Doctor of Environment
DED	Doctor of Environmental Design
DFA	Doctor of Fine Arts
DF	Doctor of Forestry
DGS	Doctor of Geological Science
DHS	Doctor of Health and Safety
DHL	Doctor of Hebrew Literature/Letters
DHS	Doctor of Hebrew Studies
DIT	Doctor of Industrial Technology
SJD	Doctor of Juridical Science
JSD	Doctor of Juristic Science
DLS	Doctor of Library Science
DMSc	Doctor of Medical Science
DMin/DM	Doctor of Ministry
DM	Doctor of Music
DMA	Doctor of Musical Arts
DME	Doctor of Music Education
DML	Doctor of Modern Languages
DNSc	Doctor of Nursing Science
PhD	Doctor of Philosophy
DPE	Doctor of Physical Education
DPS	Doctor of Professional Studies
DPA	Doctor of Public Administration
DPH	Doctor of Public Health
DRec/DR	Doctor of Recreation
RhD	Doctor of Rehabilitation
DRE	Doctor of Religious Education
DSM	Doctor of Sacred Music
STD	Doctor of Sacred Theology
DSc	Doctor of Science
DScH	Doctor of Science and Hygiene
LScD	Doctor of Science of Law
DScD	Doctor of Science in Dentistry
DScVM	Doctor of Science in Veterinary Medicine
DSSc	Doctor of Social Science
DSW	Doctor of Social Work
ThD	Doctor of Theology